Marc Wall

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

- 1970 -

COOK INLET-RESURRECTION BAY AREA

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PREFACE

The intent of this report is to update, as much as possible, statistical data of the Cook Inlet-Resurrection Bay commercial fisheries area. Data presented in this report supercedes data presented in previous management reports.

An attempt has been made to present annual data in the main body of the report and comparative data in tabular and graphic form in the appendix to lend continuity to the readability.

The content of the report is divided into six sections as follows:

1. Area Introduction. General description of the area, fishery resources, gear used, management policies and methods.

2. Area Summary. This section summarizes current year data concerning all fisheries in the area, 1970 salmon forecast and outlook.

3. Salmon Fishery. This section considers in detail each of the seven salmon districts in Cook Inlet for the current year as pertains to catch by species, emergency orders issued, escapements, highlights and problem areas.

4. Shellfish Fishery. This section considers king, dungeness, and tanner crab; in addition, the expanding Kachemak Bay shrimp fishery is discussed in detail. Current annual data is presented and compared to comparative data.

5. Miscellaneous Fisheries. This section is concerned with present trends of the herring fishery and salmon subsistence fisheries.

6. Appendix. This section includes historic biological data.

All 1970 catch statistics included in this report are preliminary and were abstracted from fish tickets.

The authors realize that this report will not meet all demands; however, we are continuing to do the best of our ability to annually improve with a thorough comprehensive annual management report as the end objective of our efforts.

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ACKNOWLEDGEMENTS

In preparing this report the management staff has had the benefit of an excellent research staff. Project leader Allen S. Davis and research biologist Paul Kissner spent many hours preparing tables, maps and illustrations and have been incorporated not to mention the many field seasons and frustrations encountered in the collection of biological, physical and chemical data used.

The annual amount of tedious work leading to and resulting in the annual management report involves several secretaries, Mrs. Eleanor Fitzgerald, Mrs. Wilma Jones, Mrs. Helen Belnap, and Mrs. Hazel Vanderbrink. We are greatly in their debt.

We are obligated to the twenty temporary personnel for their efforts and dedication in the collection of field data, often hampered by lack of funds and a public not sympathetic to the effort expended.

And last but not least our hats are off to two well seasoned veterans, Regional Supervisors Kenneth R. Middleton and Steven Pennoyer. Without their encouragement and understanding when dealing with the multiple tasks of managing this fishery some areas would have been very difficult to negotiate.

AREA INTRODUCTION

The Cook Inlet-Resurrection Bay Area includes all waters of Alaska in Cook Inlet and Resurrection Bay north of Cape Douglas and west of Cape Fairfield, including the Barren Islands (Figure 1). The area's seven fishing districts, the Northern, North Central, South Central, Southern, Kamishak, Outer and Eastern comprise approximately 51,000 square miles; about the same size as the state of New York (Figure 2).

The Cook Inlet-Resurrection Bay area has the largest proportion of the population in the State of Alaska with the resultant problems concerning multiple use of our natural resources. As one might expect, a large percent of fishermen in this area are part time or "vacation" fishermen due to the fact that other fields of employment are available during the "off" season.

Since 1960 the increase in gear registrations in the area has been tremendous, expecially drift and set gill net gear with correspondingly less income per individual fisherman.

Cook Inlet is characterized on even years by good returns of pink, coho and chum salmon, however, on odd years the sockeye is the predominant species in the catch.

All five species of Pacific salmon are found in Cook Inlet and until 1964 all five species of salmon were commercially harvested; in that year the Board of Fish and Game closed all of Cook Inlet to the commercial taking of king salmon in order to protect this species from over exploitation. However, the past two years has shown an encouraging increase in the stocks of the large Susitna Basin.

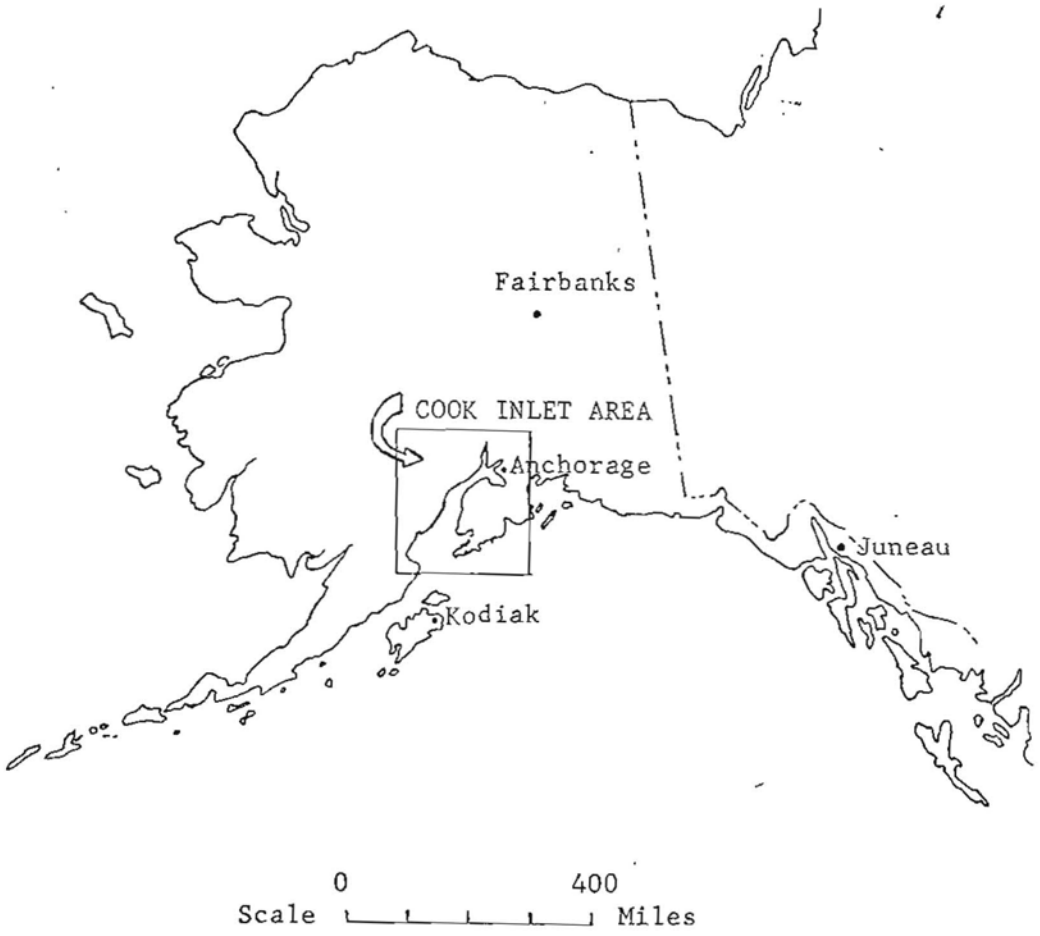


Figure 1. Cook Inlet area location map.

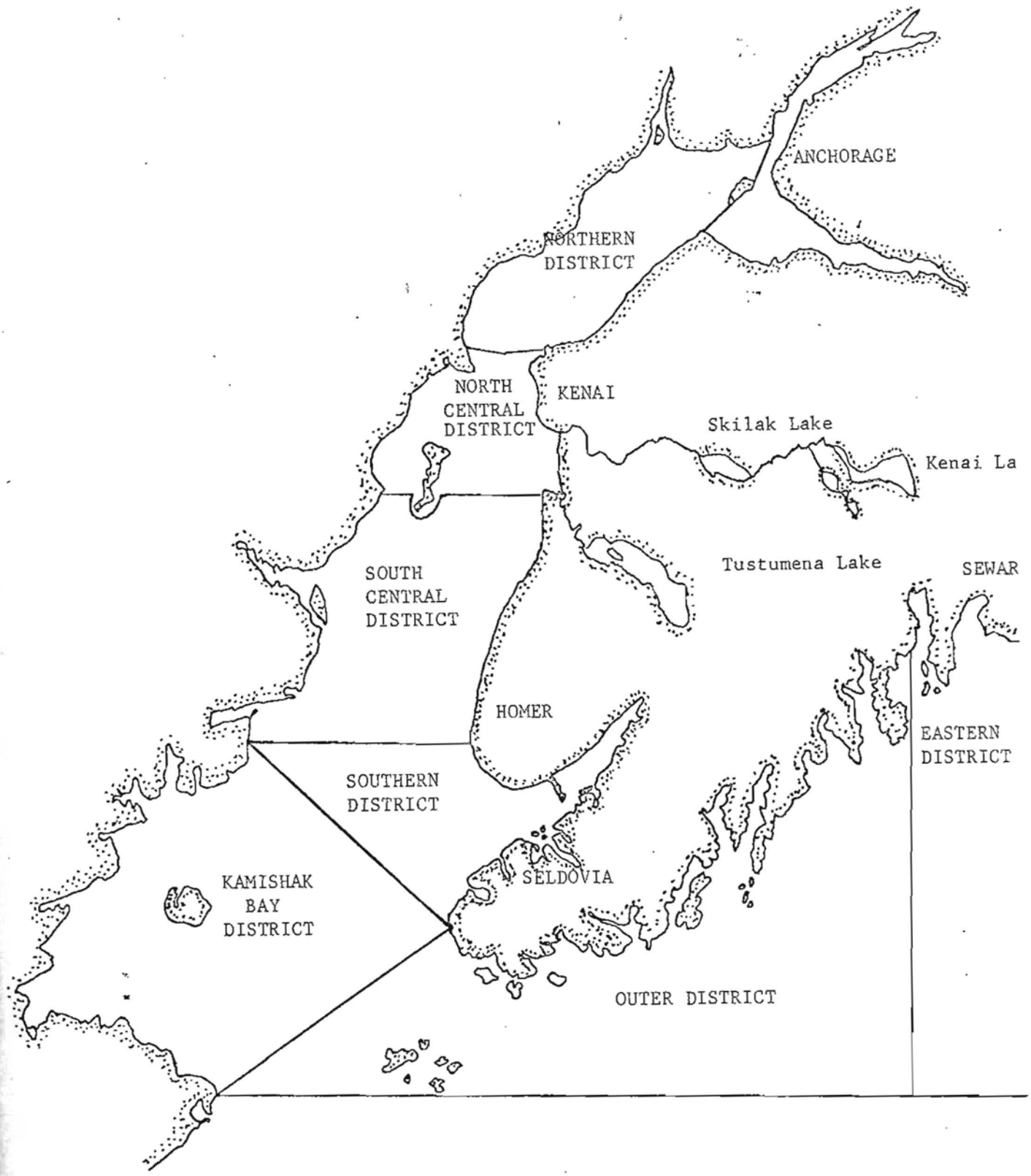


FIGURE 2. Cook Inlet-Resurrection Bay commercial fishing areas.

Based on this indication, the management staff plan to ask the Board of Fish and Game for a limited test fishery for the 1971 season. Since 1964, king salmon caught incidentally to other species have been allowed to be sold.

Based on a 17 year average, the most abundant of salmon are pink, sockeye, chum, coho and king in that order. These species have contributed 44, 29, 19, 7 and less than 1 per cent respectively.

Five types of gear are used to harvest salmon of Cook Inlet: drift and set gill nets, hand purse and beach seines, and troll gear. Set nets are the most numerous; however, drift gill nets are the most successful in terms of total catch. The most common gill net in the Inlet has a 5 1/4 inch stretched measure web.

The area commonly referred to as the gill net districts are those north of the latitude at Anchor Point ie, the South Central, North Central and Northern districts. Set gill nets are the only salmon gear allowed in the Northern district. Both drift and set gill nets are used in the North Central and South Central districts. In addition, hand purse and beach seines are allowed in the Chinitna Bay area of the South Central district in order to effectively harvest the chum run of this area. Hand purse seines are the predominant gear used in the Southern, Kamishak, Outer and Eastern districts; however, beach seines are allowed to fish the Southern, Outer, Kamishak, and Eastern districts. Trolling is allowed in the Eastern district, south of a line from Cape Resurrection to Aialik Cape.

King, dungeness and tanner crab are also harvested commercially in the Southern, Outer and Kamishak districts. King crab is the most important to the area and the catch has averaged approximately 4.5 million pounds annually over the past ten year period. In 1969, in an attempt to stablilize large annual fluctuations in the king crab catch and maintain a healthy stock of all age classes, the Board of Fish and Game established a seasonal quota of 4.5 million pounds. The season is set to turn from August 1 through February. It is the intent of the Board to retain this quota and season until biological data indicates a change is needed. At present the stock appears to be in good shape with three distinct age classes appearing in the catches including the recruitment age.

The dungeness fishery is sporadic and depends to a large degree on the strength of the Washington, Oregon and California fisheries. When these states experience a poor year the demand for Alaskan dungeness crabs increase. In the near future it appears that outside markets will continue to influence the scope of this fishery.

Since 1969 processors have shown an increased interest in Southern district tanner or "Snow" crab as the Food and Drug Administration has commonly labled this species. Processing techniques of this area are improving rapidly and meat recovery of total weight has increased from eighteen per cent over the past three year period. We expect this fishery to continue expanding in the Southern and Outer districts of Cook Inlet.

Other fisheries in the development stage and expanding rapidly are shrimp and herring. At present the shrimp fishery is located in the Southern district or Kachemak Bay proper. This fishery has increased in effort from two small boats in 1968 to four boats in 1970. Pink and humpy shrimp are the most abundant species with sidestripe and coonstripe showing in catches to a less degree. Due to the increased effort in this fishery and slight drops in catch per unit of effort during the months of October, November, and December, a public regulatory proposal was submitted to the Board of Fish and Game in December to place an annual quota of five million pounds on the Kachemak Bay area. There is a very good chance that this quota will be adopted. The local management staff has no strong objections to a quota as biological data dictates. At present different sizes of otter trawls are being employed as fishing gear.

The herring fishery has developed as the result of a demand for cured sac roe for the Japanese market. The two areas presently being fished are located in the Eastern and Southern districts. Both areas have had approximately ten seiners employed in the fishery. This is developing into a productive "off season" fishery as it usually commences in mid May and ends in mid June, after the king crab season and before the salmon season. The greatest demand as stated above is for sac roe; however, small per cents of the catch are being sold for animal (pet and zoo) food and sport and commercial fishing bait.

Continued development and interest in timber and oil are on the increase with resultant problems in critical fishing areas. At present, lower offshore Cook Inlet and the west side of the upper Inlet are generating the most attention as concerns oil exploration and development.

It is of interest to note that when the State of Alaska assumed the duties of managing and developing the commercial fisheries that the Cook Inlet area was primarily a salmon and king crab fishery with three management personnel and about 15 temporary personnel (summer employees). During this time period the area has had a vast increase in population, four seperate commercial fisheries developed, and a marked increase in the exploitation of other natural resources directly related to or effecting the fisheries resources; however, the staff of management personnel remains the same.

At present the Cook Inlet staff has three management biologist and two research biologist. Its true that research has afforded management additional tools ie., Bendix salmon sonar counters used to enumerate escapement into the Kenai and Kasilof Rivers, a pink salmon forecast for the Southern and Outer districts; however, we haven't kept pace with the movement or times - much more is needed.

The reason we haven't kept pace with the growth of the area is quite evident when the annual management budgets are reviewed; until fiscal year 1970-71 the budget in most years was below the initial FY 1960-61 budget of 94,370 dollars.

Budgets for the first few years of management were actually higher than those of recent years, including FY 1970-71, despite requests for increase. The management level of this valuable fishery is extremely low, and becomes more precarious each year as costs rise and the budget power becomes less because of rising costs.

The most important management tool used in the Cook Inlet area is the authority to regulate fishing times by issuing the emmergency order based on biological data.

AREA SUMMARY

Salmon Fishery

The 1970 commercial salmon catch for Cook Inlet totalled 3,386,329 fish, with an estimated first wholesale value of $8,524,237.[1/]

This is the lowest recorded even-year catch to date for Cook Inlet. Of the 1970 commercial salmon catch 8,054 were kings; 750,111 sockeyes; 276,770 cohos; 1,352,389 pinks; and 999,005 chums. As expected for an even year, pink salmon were predominant and contributed 44.46 per cent of the total catch; however, this was well below the 17 year average of 1,647,900 and far below the even year average for pink salmon (Appendix Table 1). This phenomena, of course, was the highlight or rather surprise of the 1970 salmon season. Several factors probably contributed to the pink salmon failure, the Susitna Basin stocks were subjected to severe winter conditions in the winter of 1968-69 ie., very little snow for an insulating cover and deep freezing of the

1/ Not included are the wholesale values of the Snug Harbor Packing Co. Salmon catch and Whitney Fidalgo Salmon roe Production.

gravel beds. In addition, it appears that all pink salmon stocks of the Inlet and other areas of the state experienced high ocean or estuarine mortalities.

The salmon catch produced a pack of 194,071 one-pound tall cases. Since 1960 there hasn't been one year with a lower even year pack. (Appendix Table 2).

Gear registrations for 1970 hit an all time high with a total of 1,661 registrations (Table 1).

Of the total, 82.5 per cent were resident fishermen and 17.5 per cent non-resident. Drift and set gill nets are the dominant types of gear and have exhibited 161 per cent and 55 per cent increases respectively, since 1960. Appendix Table 3 can be studied to depict changes and comparisons since 1960.

It is quite apparent if the Cook Inlet salmon fishery is to remain economically and biologically sound immediate measures will have to be enacted to curtail drift and set net efforts, especially in the gill net districts north of Anchor Point.

Fishing time or periods have been the basis for regulating salmon catch and escapements in Cook Inlet as mentioned before. In 1970 base time for the gill net districts was set at three 12-hour periods (Monday, Wednesday and Friday) per week.

Actual fishing time varied quite a bit from the base time as outlined above and will be discussed as to reasons under district summaries of this report.

TABLE 1. Cook Inlet-Resurrection Bay salmon gear registration, by type and resident versus non-resident, 1970.

Gear Type	Resident	Non-Resident	Total
Hand Purse Seine	86	3	89
Drift Gill Net	537	220	757
Set Gill Net	707	65	772
Troll	23	2	25
Beach Seine	18	0	18
Total Effort Registered	1371	290	1661

Other districts of the Inlet remained on the same weekly fishing periods as previous years and will be discussed in the district summary of this report.

In general, escapements of the gill net districts were poor for all species except king salmon in the Susitna Basin in spite of managements efforts to curtail fishing time. One of the major problems in obtaining adequate escapements of this area is that the majority of major trunk streams ie., the Kenai, Kasilof and Susitna Rivers are glacial and totally adequate means have not been found to enumerate escapements into these systems close to the fishery.

The Southern and Outer districts generally speaking received adequate escapements.

1970 Forecast

The Southern and Outer districts of Cook Inlet are the only areas where forecasts of total return are made based on scientific data. The forecast for these two districts is for pink salmon only, and is based on the relationship between the density of pink salmon fry found in the gravel and subsequent returns of adult salmon (Davis, Allen S., Cook Inlet Annual Management Report, 1968).

The 1968 brood year alevin density as calculated from the sampling conducted in the spring of 1969 was 385 fry per square meter. On the basis of the linear regression of return on alevins as shown in Figure 3, this density results in an estimated total return of 2,000,000 pink salmon (catch plus escapement) in 1970 to the Southern and Outer districts. With 90 per cent confidence limits the range of

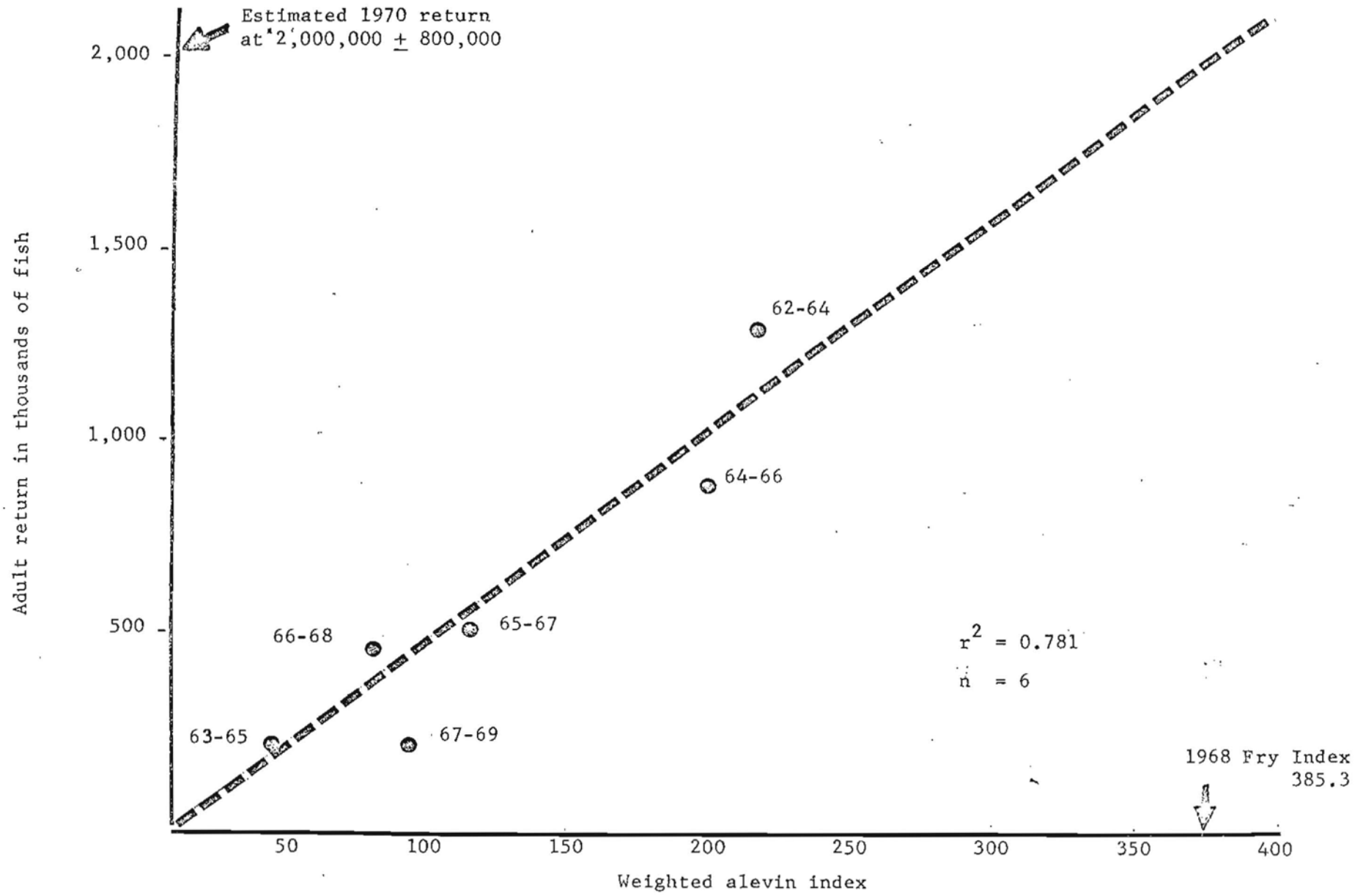


Figure 3. Cook Inlet Southern and Outer districts, pink salmon, relationship between total return (catch plus escapement) and weighted alevin index

the prediction would be 1,040,000 to 2,960,000 salmon. This forecast of two million pink salmon should be evaluated with some caution. The 1969 fry density of 385 fry per square meter is the largest density observed to date, and, as noted in Figure 3, this requires forecasting on the basis of a fry density level nearly twice as large as any previously observed density. From a statistical standpoint, the resulting 1970 forecast is made with less confidence than a forecast based on a fry density of a level previously observed. This is partially illustrated by the relatively wide range of the confidence interval. (Davis, Allen S., Information Leaflet 143).

No predications are made for any species returning to the other districts of Cook Inlet. Usually the most recent five year catch, by species, is used as an indication of what might be expected. However, at best, this is far from adequate. In the near future, methods must be devised to adequately predict total inshore returns in order for biologist, industry and fishermen to prepare realistically for a given year's operation.

The anticipated catch based on the Southern and Outer districts' forecast and average catch trends was about 6.0 million salmon. However, the actual catch was 3.4 million slightly above 50 per cent of what we thought would be caught. The two species that were way below the even year average catches were pinks and sockeye salmon.

It becomes quite apparent when comparing the actual catch to the anticipated catch the problems faced by industry, fishermen and management biologists. Industry, of course, was geared up to process twice the numbers of salmon; fishermen hired additional help and invested in gear; and biologists walked a tight rope, in opening and closing fishing times, waiting for an anticipated run that never developed. It is evident that all of the above adds up to wasted dollars and effort and an inefficient operation for all concerned. As long as management "forecasts" are based on catches instead of sound biological data, the above conditions will continue.

Salmon Processors and Products

Thirty-two processors filed Intent to Operate forms in 1970. Of the total, 23 filed to processed canned, frozen or smoked salmon; 6, halibut; 4, dungeness crab; 4, king crab; 4, tanner crab; and 5, shrimp. In addition, processing of herring roe, salmon roe, scallops, clams and cod were indicated (Table 2). Individual prices paid to fishermen can be found in Table 2.

The total 1970 salmon case pack, expressed in 48 pound cases, was 194,071 cases. This again was the lowest even-year pack for the period 1960 to 1970. (Appendix Table 2).

However, a word of caution should be inserted when comparing annual case packs. Canneries of the Inlet have brought salmon in from other areas in the past to be processed. As far as can be ascertained, these salmon have been included in the annual case pack report and, therefore, the report should not be used for comparative purposes until adjustments

TABLE 2 Cook Inlet-Resurrection Bay area processor and related data, 1970.

Commercial Operator	Plant Location	Product	Average Price to fishermen
Alaskan Scallop Processor Inc. Box 7, City Dock Seward, Alaska 99664	Lowell Point Rd. Seward	Scallops, Fresh Herring: Sac Roe Whole	1.03 per lb. .02 per lb. .02 per lb.
Alaskan Seafoods, Inc. Box 173 Homer, Alaska 99603	Homer Spit	Canned 1/2 #Flats Pinks Chums Frozen: Reds Cohos Pinks Chums Halibut Herring (Bait) King Crab Dungeness Crab Tanner Crab Shrimp (Machine picked)	 .14 per lb. .17 per lb. .29 per lb. .28 per lb. .14 per lb. .17 per lb. .29 per lb. .03 per lb. .27 per lb. .14 per lb. .10 per lb. .04 per lb.
American Freezerships Div. of W.R. Grace Co. Bldg. C-3, Fishermens Terminal Seattle, Washington 98119	Ninilchik	Canned #1 Talls Kings Reds Cohos Pinks Chums	 .30 per lb. .30 per lb. .28 per lb. .13 per lb. .14 per lb.
Anchorage Seafood Co. 513 Northern Lights Blvd. Anchorage, Alaska 99503	Anchorage	Fresh: Shrimp	 .03 per lb.

Table 2 Cont'd

Commercial Operator	Plant Location	Product	Average Price to fishermen
Columbia Wards Fisheries Box 30 Seattle, Washington 98105	Kenai	Canned 1# Talls, 1/2 lb Flats 1/4 lb Flats	
		Kings	.25 per lb.
		Reds	.25 per lb.
		Cohos	.17 per lb.
		Pinks	.13 per lb.
		Frozen:	
		Chums	.14 per lb.
		Cohos	.14 per lb.
		Salmon Roe	
		All species	--
Bud S. Deitz Box 587 Homer, Alaska 99603	Homer	Smoked	
		Kings	--
		Reds	--
		Cohos	--
		Pinks	--
		Chums	--
Ekren Packing Company Kasitsna Bay Homer, Alaska 99603	Kasitsna Bay	Canned 1/2# Flats	
		Reds	--
		Pinks	--
		Cohos	--
		Dungeness Crab	--
		Butter Clams	--
Dan Garroutte Box 122 Ninilchik, Alaska 99639	Ninilchik	Frozen	
		Kings	.40 per lb.
		Reds	2.00 each
		Cohos	.37 1/2 per lb.
		Pinks	.60 each
		Chums	1.25 each
		Halibut	.30 per lb.

Table 2 Cont'd

Commercial Operator	Plant Location	Product	Average Price to fishermen
Keener Packing Co. Route 2 Soldotna, Alaska 99660	Soldotna	Frozen:	
		Kings	.40 per lb.
		Reds	1.74 each
		Cohos	.35 per lb.
		Pinks	.58 per lb.
		Chums	.18 per lb.
Kenai Packers 1455 N. Northlake Pl. Seattle, Washington 98103	Kenai	Canned 1#Tall 1/2 # Flat 1/4 # Flat	
		Kings	.23 per lb.
		Reds	1.69 1/2 each
		Cohos	1.10 each
		Pinks	.57 1/2 each
		Chums	.77 1/2 each
		Salmon Roe	
		Kings	--
		Reds	--
		Cohos	--
		Pinks	--
		Chums	--
Marubeni-Iida (America) Inc. 1001 Fourth Ave Seattle, Washington 98104	Columbia Wards, Kenai Kenai Packers, Kenai	Salmon Roe	
		Kings	--
		Reds	--
		Cohos	--
		Pinks	--
		Chums	--
Luba Moser Box 53 Clam Gulch, Alaska 99568	Clam Gulch	Smoked (mild cure & hard)	
		Kings	.40 per lb.
		Reds	.50 per lb.
		Cohos	.50 per lb.

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
William R. Muse 3 miles Cannery Mile 3 Seward Highway Seward, Alaska 99664	Seward	Frozen	
		Pinks	.18 per lb.
		Fresh	
		Halibut	.35 per lb.
Robert Olsen Box 1162 Seward, Alaska 99664	Seward	Frozen	
		Shrimp tails	--
R. Lee Seafoods Route 2 Soldotna, Alaska 99669	Soldotna	Frozen	
		Kings	.40 per lb.
		Reds	.32 per lb.
		Cohos	.25 per lb.
		Pinks	.14 per lb.
		Chums	.18 per lb.
		Halibut	.33 per lb.
		Salmon Roe	
		Reds	--
		Cohos	--
		Pinks	--
		Chums	--
Seward Fisheries Box 156 Seward, Alaska 99664	Seward	Frozen	
		Kings	.48 per lb.
		Reds	.28 per lb.
		Cohos	.31 per lb.
		Pinks	.15 per lb.
		Chums	.16 per lb.
		Halibut	.34 per lb.
		Herring (Bait)	--
		Black Cod	.20 per lb.
		King Crab (Sections)	.33 per lb.
		Tanner Crab (Sections)	.10 per lb.
		Scallops	1.03 per lb.
		Eel	.20 per lb.
		Gray Cod	.16 per lb.

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
Seward Marine Services Box 335 Seward, Alaska 99664	Seward	Herring Sac Roe	.02 per lb.
Charles L. Simon Seafoods Route 2 Kasilof, Alaska 99610	Kasilof	Frozen	
		Kings	.40 per lb.
		Reds	.30 per lb.
		Cohos	.40 per lb.
		Pinks	.55 each
		Hand packed 1/2# Flat	
		Reds	.30 per lb.
		Smoked 1/2# Flat	
		Kings	.40 per lb.
		Cohos	.40 per lb.
Smoked Alaskan Seafoods Clam Gulch, Alaska 99568	Clam Gulch	Canned 1/2# Flats	
		Reds	1.70 each
		Cohos	1.39 each
Sterling Sausage Co. Sterling, Alaska 99672	Mi. 81 Sterling Hwy	Canned 1/2# Flats	
		Kings	.40 per lb.
		Reds	.35 per lb.
		Cohos	.32 per lb.
		Pinks	.10 per lb.
		Chums	.20 1/2 per lb.
		Kippered	
		Reds	.35 per lb.
		Cohos	.32 per lb.

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
Tarvald Jensen & Co Ninilchik, Alaska 99639	Ninilchik	Smoked	
		Kings	--
		Reds	--
		Cohos	--
		Chums	--
Tidewater Packing Co. Box 1842 Anchorage, Alaska 99501	Anchorage	Canned 1/2# Flats	
		Kings	6.00 each
		Reds	1.60 each
		Cohos	1.15 each
		Pinks	.48 each
		Chums	.83 each
		Smoked	
		Kings	6.00 each
		Reds	1.60 each
		Cohos	1.15 each
		Pinks	.48 each
		Chums	.83 each
		Fresh	
		Cohos	1.15 each
		Salmon Roe	
		Reds	
		Cohos	
		Pinks	
		Chums	

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
Whitney Fidalgo Seafoods Inc. Box 99008 Seattle, Washington 98199	Anchorage Terminal Yds	Canned 1# talls, 1/2# flats	
		Reds	.25 1/2 per lb.
		Cohos	.19 1/2 per lb.
		Pinks	.14 1/2 per lb.
		Chums	.12 1/2 per lb.
		Salmon Roe	
		Kings	-0-
		Reds	-0-
		Cohos	-0-
		Pinks	-0-
		Chums	-0-
Whitney Fidalgo Seafoods, Inc. P.O. Box 99008 Seattle, Washington 98199	Anchorage Int. Airport Rd.	Frozen	
		Kings	.40 per lb.
		Reds	.25 per lb.
		Cohos	.19 per lb.
		Pinks	.14 per lb.
		Chums	.12 per lb.
Whitney Fidalgo Seafoods, Inc. P.O. Box 99008 Seattle, Washington 98199	Port Graham	Canned 1# tall	
		Reds	.26 per lb.
		Cohos	.20 per lb.
		Pinks	.15 per lb.
		Chums	.12 1/2 per lb.

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
Waterfall Fisheries Corp Box 667 Soldotna, Alaska 99669	Kasilof	Canned 1# tall	
		Reds	.29 per lb.
		Cohos	.20 per lb.
		Pinks	.14 per lb.
		Chums	.18 per lb.
		Frozen	
		Reds	.29 per lb.
		Chums	.18 per lb.
		Cohos	.20 per lb.
Wakefield Fisheries Port Wakefield, Alaska 99550	Seldovia	Frozen	
		King Crab	.25 1/2 per lb.
		Tanner Crab	.10 per lb.
Chatham Fisheries Seward, Alaska	M/V Chatham	Herring	
		Whole	.02 per lb.
		Sac roe	.02 per lb.
International Seafoods 427 Bellvue Ave, E Seattle, Washington	Kasilof	Herring	
		Whole	.01 1/2 per lb.
Sportsmans Lodge Cooper Landing, AK	Cooper Landing	Canned 1# tall	
		Reds	2.00 per Salmon

Table 2 Con't

Commercial Operator	Plant Location	Product	Average Price to fishermen
Sea Shops Box 593 Homer, AK 99603	Homer Spit	Fresh	
		Reds	--
		Pinks	--
		Cohos	--
		Kings	--
		Halibut	.30 per lb.
		King Crab	.25 per lb.
		Dungeness Crab	.12 per lb.
		Tanner Crab	.10 per lb.
		Shrimp	.40 per lb.
Osmar's Ocean Specialties Box 38 Clam Gulch, Ak	Clam Gulch	Frozen	
		Kings	.40 per lb.
		Reds	.30 per lb.
		Cohos	.30 per lb.
		Pinks	.14 per lb.
		Chums	.11 per lb.
Snug Harbor Packing Co. Fishermen's Terminal Seattle, Washington	Snug Harbor	Canned 1# tall	
		Kings	.25 per lb.
		Reds	.32 per lb.
		Cohos	.18 per lb.
		Pinks	.16 per lb.
		Chums	.14 per lb.
Herring Northwest Seward, Alaska 99664	Seward	Herring	
		Sac Roe	0.1 1/2 per lb.
		Roe on Kelp	0.45 per lb.

by year have been made. About the only thing the pack report can be used for at present is the actual number of cases put up in Cook Inlet by year.

Total pounds of salmon put up as fresh-frozen amounted to 2,872,527 pounds. Salmon used for this purposes have been steadily increasing since 1964 (Appendix Table 4). The reason being is that this product brings a higher price than the canned product and is of better quality. Chums made up the largest proportion of the pack, a total of 1,437,844 pounds were frozen.

Shellfish Fishery

The 1970-71 king crab catch fell short of the 4.5 million pounds quota by about 600,000 pounds. The total catch was 3,882,802 pounds, of this 1,495,759 pounds were taken in the Kachemak or Southern district, 2,237,259 pounds in the Kamishak district and 149,784 pounds were taken from the Outer district. We feel that if the weather during January and February had been average the quota would have been reached. A total of 41 boats registered to fish Cook Inlet; however, all of them didn't fish and actual effort will be discussed in the shellfish section of this report. Fishermen received about .26 per pound which amounted to 1,009,528 dollars for the total catch.

A total of 1.3 million pounds of tanner crab were processed this year, slightly below the 1969 harvest of 1.5 million pounds. The highest catches of the year were made in April and May when 414 thousand and 363 thousand pounds respectively were taken in the

Southern district. To date, the Southern district is the only area of Cook Inlet where tanner crab are being harvested. Fishermen received .10 per pound for tanner crab and received 129,500 dollars for the total catch.

The dungeness fishery in terms of pounds landed has been very erratic in the past and, as mentioned earlier, is probably due to the demand brought on by fluctuating catches in Oregon, Washington, and California. The catch since 1961 has fluctuated from a high of 1,677,204 pounds in 1963 to a low of 7,168 pounds in 1967. This year fishermen landed 208,577 pounds. The largest catches were made in September, October and August in that order and amounted to 88.3 per cent of the total catch. Fishermen received an average of .13 per pound and the total catch was worth 27,115 dollars.

The shrimp catch increased sharply from the 1969 catch (1.8 millon pounds) and amounted to 5,772,393 pounds. This increase was mainly due to the addition of two large vessels entering the fishery bringing the total effort to four boats. One of the new vessels is 58 foot and the other 78 foot; unlike the two smaller vessels (35 feet), these boats can fish rough weather and are able to maintain a satisfactory trawling speed in heavy currents. Fishermen were paid .04 per pound for shrimp delivered whole which amounted to 230,895 dollars for the total catch. The entire 1970 catch was made in Kachemak Bay.

Herring

As in 1969 herring were harvested in two areas of Cook Inlet, the Southern and the Eastern district. Fishing in the Southern district was confined to the Halibut Cove area. In the Eastern district, almost all catches were made in or just outside of the Seward Small Boat Harbor. Catches increased considerably in both areas from that of 1969 (1,350 tons), 2,708.2 tons were taken in the Southern district and 2,099.6 tons from the Eastern district for a total catch of 4,807.8 tons. Of this, approximately 78.9 per cent was used as bait.

Fishermen were paid an average of 0.02 cents per pound for herring. The total value to fishermen for the 1971 catch was 192,312 dollars.

Average recoveries by weight of herring and the first wholesale value of the product are not available at this writing.

Salmon Roe Production

A total of 733,893 pounds of salmon roe was processed in 1970. The first wholesale value of this product is estimated at $843,977.

The total poundage for 1970 is twice the amount processed in 1969 (312,641 pounds).

Subsistence Fishery

There were 449 subsistence permits issued in 1970, about the same as 1969. Of these, 290 were for the Northern district, 45 for the North Central-South Central districts, 78 for the Southern district and 36 for the Eastern district.

A total of 5,221 salmon were reported, of these the species breakdown was 3 kings, 1,218 sockeye, 3,371 coho, 437 pinks and 152 chums. Breakdown by district and by species can be seen in Table 3.

Field Projects

In the day to day management of the salmon fisheries information is gathered and complied from different field stations in Cook Inlet. In 1970 the management section had eleven projects and research had five. For the sake of brevity, a listing of each project and the major objectives are listed.

1. Susitna Test Site

This project was designed in 1969 for the purpose of attempting to establish an index of escapement by species for the Susitna River.

The site is located approximately 25 miles upstream from the mouth of the river where all waters are in one channel. Two temporary employees operate the site from mid May through August 15.

A fishwheel and set nets are used to collect biological data and it is hoped that the program objectives and goals will expand with each year.

A comprehensive seasonal completion report, by year, is on file in the Anchorage and Homer offices for those interested.

Table 3. 1970 subsistence catch salmon, as of December 4, 1970

Location	Catch By Species							Total Permits		Number of Fish Caught			
	Kings	Reds	Cohos	Pinks	Chums	Other	Total	Issued	Returned	None	50 or Less	50 or Over	Not Fished
NW Shore Knik Arm	3	781	1,414	161	78		2,437	187	168	10	91	1	66
NW Shore Knik-Goose Bay/ Fish Creek Area	0	164	326	62	49		601	45	41	4	25	-	12
NW Shore Knik-South of Cotton Wood Creek	0	71	238	38	10		357	44	39	4	17	-	18
NW Shore Knik-McKenize Pt	0	17	29	1	1		48	9	6	0	4	-	2
Fire Island			2	3			5	5	5	0	2	-	3
Total Northern District	3	1,033	2,009	265	138		3,448	290	259	18	139	1	101
Near Arness Dock			28				28	7	7	-	2	-	5
Near Nikiski Dock		2	48				50	4	4	-	2	-	2
Salamatoff Beach			33				33	6	5	1	1	-	3
Kalifonski Beach			32	18			50	2	2	1	1	-	-
Kasilof			6				6	3	2	-	1	-	1
Clam Gulch								1	1	-	-	-	1
Cohoe		6					6	1	1	-	1	-	
Ninilchik			33				33	17	15	-	3	-	12
Tyonek to McArthur River							-	2	2	-	-	-	2
Tuxedni Bay							-	2	1	-	-	-	1
Total North & South Central Districts		8	180	18			206	45	40	2	11	-	27

Table 3 Cont'd

1970 Subsistence catch salmon, as of December 4, 1970 (Con't)

Location	Catch by Species							Total Permits		Number of Fish Caught			
	Kings	Reds	Cohos	Pinks	Chums	Other	Total	Issued	Returned	None	50 or Less	50 or Over	Not Fished
Just South of Anchor Point						-	-	2	2	2	-	-	-
Green Timbers			45		7		52	1	1	-	-	1	-
Mud Bay			683	42	6	35 1/	766	48	44	3	27	-	14
Millers Landing		1	358	27			386	18	18	1	13	2	2
McNeil River & Head Kachemak Bay			16	6		3 2/	25	4	3	1	1	-	1
Yukon Island				50			50	1	1	-	1	-	-
Neptune Bay			24	18			42	2	2	-	1	-	1
China Poot Bay		11	21			1 3/	33	1	1	-	1	-	-
English Bay			32				32	1	1	-	1	-	-
Total Southern District		12	1,179	143	13	39	1,386	78	73	7	45	3	18
Resurrection Bay (Total Eastern District)		165	3	12	1		181	36	35	4	16	-	15
TOTAL COOK INLET	3	1,218	3,371	438	152	39	5,221	449	407	31	211	4	161

1/ 2 Sharks & 33 Flounders

2/ 3 Sharks

3/ 1 Dolly Varden

2. Kenai - Kasilof Sonar Site

In 1968 the Bendix Corporation, under contract to the Department of Fish and Game, made available sonar counters for obtaining an estimate of sockeye escapements into the glacial Kenai and Kasilof Rivers.

This project commences in late May and continues through the first week of August.

The Cook Inlet research project leader is responsible for this project and three temporary aides are employed each summer to man and maintain the site.

3. Fish Creek Weir

Fish Creek is located at the upper end of Cook Inlet and drains Big Lake into Knik Arm. From 1960 through 1969, the Department operated a counting tower during the month of July, for the purpose of obtaining daily escapement count of sockeye salmon into the system. In 1970, a weir was installed for the purpose of obtaining a daily count of sockeye, pink and coho salmon.

Tenure of the project was from July 1 through August. One temporary employee mans and maintains the weir.

4. Russian River Weir

Russian River is located on the Kenai Peninsula and is an important sockeye tributary of the Kenai River. Until 1970, a counting tower was operated on the Russian River and counts of

sockeye were made for 15 minutes of each hour and then expanded for a total escapement estimate. However, a total count was more desirable and in 1970, a weir was constructed June 15 and operated through August 15.

One temporary employee, under supervision of the Assistant Area Biologist, is responsible for the project.

5. Commercial Catch Sampling

Each year a crew of three to four temporary personnel are hired to sample the Cook Inlet commercial catch. The major objective is to obtain age, weight and length data from the sockeye catch. However, information has been collected on king and chum salmon.

Usually, sampling begins on the first open fishing period and continues to the first of August. At present, Kenai Packers, Columbia Wards and Whitney Fidalgo are sites of data collection.

6. Stream Clearance

This project has become one of limited activity. Until 1968, beaver dams and stream obstructions to salmon migration were removed by dynamite. However, in that year the Department of Labor refused to issue a restricted blasting permit to continue this work. Therefore, the management staff has been able to remove only those obstructions that can be taken out by hand, chainsaw, etc. Usually a two-man crew does this work in the Susitna Basin only during the month of July.

7. Escapement Surveys

Escapement surveys, by foot, boat and air commence in late June and continue into September. Most of the escapement surveys, with the exception of key streams in the Southern and Outer districts, are estimates or counts made in specific index areas.

Again, like most of our escapement work, emphasis is on sockeye salmon.

The bulk of all escapement surveys are done by permanent biologists.

8. Fishery Surveys

Each year flights are made over the fishery as often as time and money allow. Information gathered includes effort by type of gear and general impressions of catches in a given day and location. All flights are made by permanent personnel.

9. Beach Surveys

Commencing June 15 of each year, one temporary employee is assigned the task of driving the east side beach of Cook Inlet from the Kenai River south to Ninilchik. The major objective of this survey is to obtain average catch per unit of effort, by species and location, and to relay this information to the Homer office. In addition, age, weight, length data is collected from king and sockeye salmon.

In the past this has been a valuable liason for ADF&G and west side set net commercial fishermen.

10. Tagging Projects

The Alaska Board of Fish and Game directed the local staff to conduct a tagging study in the Kachemak Bay area in an attempt to determine migration routes, timing and spawning distribution of coho salmon being caught in the commercial fishery of Mud Bay. Mud Bay is located adjacent to the north east side of the Homer Spit.

The tagging study was prompted by a controversy over possible allocation of silver salmon of the area to sports fishermen and/or commercial fishermen.

Results of the study will be available in report form at the Homer office and be presented to the Board of Fish and Game at the 1970 fall Board meeting.

SALMON FISHERY

Northern District Summary

The salmon catch for the Northern district was 347,282 or 10 per cent of the total Cook Inlet catch (Table 4). As expected, for an even year, pink salmon were the most abundant and contributed 50 per cent of the catch. Sockeye were second (19 per cent), followed by cohos (24 per cent), chums (6 per cent) and kings (1 per cent).

The precedent set in 1969 of 12-hour fishing periods was again instituted in 1970. Base time was set at three 12-hour periods per week from June 17 to July 14 and increased to three 16-hour periods per week commencing July 15. Fishing days were Monday, Wednesday and Friday.

TABLE 1. Cook Inlet total salmon catch, by species, 1954-1972.

Year	Kings	Reds	Cohos	Pinks	Chums	Total
1954[1/]	65,325	1,246,672	336,685	2,460,051	775,659	4,884,392
1955	46,499	1,064,128	180,452	1,286,008	317,053	2,894,140
1956	65,310	1,295,095	207,534	1,803,295	870,269	4,241,503
1957	42,767	670,629	127,199	306,841	1,207,920	2,355,356
1958	22,847	496,842	241,561	2,598,314	596,179	3,955,743
1959	32,783	634,313	112,664	137,255	411,157	1,328,172
1960[2/]	27,539	948,040	314,153	2,023,252	766,079	4,089,063
1961	19,778	1,185,079	119,397	337,394	405,221	2,066,869
1962	20,270	1,172,859	358,051	4,960,030	1,149,841	7,661,051
1963	17,632	958,101	203,876	234,052	525,537	1,939,198
1964	4,622	990,709	462,114	4,287,378	1,402,419	7,147,242
1965	9,751	1,426,352	154,363	139,561	344,052	2,074,079
1966	8,586	1,867,372	295,042	2,585,616	661,883	5,418,499
1967	8,035	1,409,107	180,455	407,717	382,282	2,387,596
1968	4,600	1,200,138	473,645	2,862,939	1,183,037	5,724,359
1969	12,462	815,050	101,575	235,866	331,058	1,496,011
1970	8,054	750,111	276,770	1,352,389	999,005	3,386,329
1971	19,838	658,537	105,197	428,495	475,631	1,687,698
1972[3/]	16,108	933,935	82,566	644,319	697,056	2,373,984

1/ 1954-1959 data - Fish and Wildlife Service Statistical Digest 50.

2/ 1960-1971 data - Alaska Department of Fish and Game IBM Salmon Reports.

3/ 1972 data - Alaska Department of Fish and Game Fish Tickets.

TABLE 4. Salmon catch, by species, Northern District, 1954-1970

Year	Kings	Reds	Silvers	Pinks	Chums	Total
1954	22,585	120,508	139,464	347,040	84,571	714,168
1955	20,522	52,927	46,365	3,226	40,321	163,361
1956	18,457	114,612	80,322	398,851	169,545	781,787
1957	21,422	90,431	44,416	1,678	101,454	259,401
1958	9,308	69,222	100,813	408,043	92,227	679,613
1959	13,222	134,930	41,230	2,348	50,699	242,429
1960	8,218	148,247	144,377	442,185	117,739	860,766
1961	7,755	77,374	40,975	10,765	61,103	197,972
1962	9,778	130,934	172,562	279,599	143,757	736,630
1963	7,345	109,463	63,540	8,940	43,694	232,982
1964	168	160,264	167,928	586,386	126,958	1,041,704
1965	300	31,412	21,752	4,848	16,775	75,087
1966	404	131,080	80,550	371,960	35,598	619,592
1967	184	118,065	43,854	8,460	38,384	208,947
1968	471	140,575	156,648	534,839	58,454	890,987
1969	2,704 ~~2,922~~	38,065 ~~37,523~~	20,425 ~~19,293~~	7,620 ~~6,993~~	11,836 ~~11,732~~	80,850 ~~78,463~~
1970	1,458	66,460	82,735	174,207	22,422	347,282
Total	144,519	1,734,027	1,446,824	3,590,368	1,215,433	8,131,171
17 year average	8,501	102,002	85,107	211,198	71,496	478,304
Percent	1.8	21.3	17.8	44.2	14.9	100.0

The catches for the first three periods were primarily of early king and red runs into the Susitna Basin. Catches during this time seemed to be on par with previous years. Fishing on the main run, however, failed to pick up as expected. Catches creeped along into July increasing very slowly. The catch on July 6 was the highest so far and was only about 1,600 fish, mostly reds. On July 8, the North and South Central districts were closed down. The Northern district was left open and the catch jumped to about 9,500 fish, mostly reds with a strong showing of cohos, and increased to about 17,000 fish on the next period, July 10, with about the same species composition as July 8. Catches for the next period, July 13, dropped to 4,500 fish and stayed down over the next two periods.

As of July 15, no fish had passed through the Fish Creek weir. In an effort to assist escapement into Fish Creek the east side of the Northern district was closed for one period on July 17. The North Central and the east side of the South Central were also closed at this time. Catches were still low so the next period, July 20, was cut to 12-hours with the whole Northern district open. The July 20 catch was 80,000 fish composed of 31,000 pinks, 27,000 cohos, 17,000 reds and the rest chums.

The next period, July 22, was increased to the standard 16 hours. Catches dropped to 64,000 with 45,000 pinks, 10,000 cohos, 8,000 reds and the rest chums. Northern district fishing time was again restricted to 12 hours for the next period, July 24, with the Central districts closed.

Catches on the 24th dropped to 53,000 with 39,000 pinks, 7,000 cohos, 5,500 reds and the rest chums. Catches over the next three periods dropped from 4,500 on July 27 to 26,000 on July 29 to 19,000 on July 31, with the greatest loss attibuted to pinks. July 31 was the last of the Northern district catches of any magnitude. The district was closed on August 5, opened for 12 hours on August 7, for 16 hours on August 8 and reverted to the standard 16 hours/day Monday, Wednesday and Friday on August 10. In the Northern district, reds, chums and cohos are predominately four-year fish, kings are normally five-year fish and pinks are two-year fish. Kings and silvers are the only species with catches in 1970 better than the brood year. The catch for the other species was about half the brood year catch (see Table 4).

Although the incidental king catch was quite a bit lower than 1969 it was still far above the average since 1964. Since king escapement seemed as good if not better than 1969 the reduction in catch might be a result of the poor weather conditions experienced during the first three periods when king catches are normally the highest.

The 1970 red salmon catch was the lowest even-year catch since 1954. Reds made up 19 per cent of the total district catch which is 13 per cent below the ten-year average. This season red ran about 13.2 to the case.

Chums also had the lowest even-year catch since 1954. They made up 6 per cent of the total Northern district catch, less than half the ten-year average. Average number of chum per case was 11.6 in 1970.

The silver salmon catches held around the ten-year average. They made up 24 per cent of the Northern district catch and ran about 12.1 to the case.

As is common in even-years, pinks contributed the greatest bulk of the Northern district catch, comprising about 50 per cent of this season's total, about average. However, this year's catch was the lowest even-year catch since 1954. They were comparatively large fish with the average number of fish per case running about 21.6.

Comparative annual catches of king, red, coho and chum are presented in Appendix Figures 1, 2, 3 and 4.

Surveys of the fishery began on the opening period June 17 and continued at irregular intervals until July 27. The surveys were made in a Cessna 180 as time and money permitted. The number of nets fishing, the number of fish in the nets and in the scows, and beluga and/or oil pollution observed, if any, was recorded.

The lowest effort observed was on the first period with 95 nets fishing. The highest effort recorded was on July 24 with 440 nets fishing. At the beginning of the season the east side beaches had the bulk of the effort; however, after the first week in July the west side accounted for the most nets (Table 5). Table 6 gives the low, high and mean for fishing effort in the Northern district since 1963.

Appraising escapement into the Northern district is a marginal business at best. The area is quite large and most of the systems are silty water. As a consequence only three aerial surveys were made. The only definitive escapement obtained in the Northern district is for

TABLE 5. Aerial surveys of Northern District fishery, 1970.

Survey	Date	Units of gear 1/ Fire Isl.	East Side	West Side	Kustatan	Boulder Pt. E. Foreland	Total Effort
1	June 17	3	41	51	13	11	119
2	June 19	-	71	56	15	20	162
3	June 22	5	70	73	17	26	191
4	June 24	3	69	55	13	20	160
5	July 1	2	83	75	28	29	217
6	July 6	6	117	93	26	46	288
7	July 8	5	95	45			145
8	July 10	10	102	141	22	46	321
9	July 24	22	151	277			440
10	July 27	26	106	263	26	48	469
Seasonal Average		8	91	113	20	31	251
Per cent		3.2	36.0	44.8	6.3	9.7	100.0

1/ Set gill net gear. One unit is 35 fathoms.

TABLE 6 . Northern District yearly fishing effort, 1963 - 1970 expressed in number of nets fishing.

Year	High	Low	Mean
1963**	464	184	294
1964**	443	176	295
1965*	446	94	321
1966	429	8	256
1967	303	74	202
1968	398	164	280
1969	300	134	221
1970	440	95	211

** Includes Northern District to Kustatan and East Forelands to Boulder Pt.
* Includes East Forelands to Boulder Pt.

Fish Creek in Knik Arm which will be discussed later.

The sport fisheries division conducts extensive king salmon surveys in the Northern district especially in the Susitna Basin. According to their figures the king escapement was quite good being on par or better than escapement in 1969.

Escapement of other species can only be guessed at. In view of the poor catches, results of the aerial surveys and incidental information from the sport fisheries division, it is assumed that escapement was below par.

Except for World War II, Fish Creek has been continuously enumerated for red salmon escapement since 1936. Up through 1963 a counting tower was employed; however, in 1969, in an effort to more closely define the escapement, a weir was installed. Particulars on the weir may be found in the 1969 Northern district annual report.

In 1970 the weir was again installed. It was well rocked and chicken wire was placed along the bottom to prevent jacks from slipping through. The weir was completely in place by July 3. Starting around July 7 fish began to show up at the stream mouth; however, it wasn't until the high tides of July 19th thru the 23rd that fish moved up to the weir. Tides were high enough at this time to completely inundate the weir and some fish were able to get over the top. Except for those that got over no fish passed. They would mill in front of the weir, but seemed unable to find the passage through it. On July 21, fearing that there was too much of a barrier, the weir was moved about 70 yards

upstream and placed in an eight foot culvert where the current was faster and the tide had little effect. This proved a much more satisfactory arrangement for passing fish. Because of the fast current, difficulties arose in sampling fish for species composition and scales. Alternations in the trap remedied the situation slightly.

Further problems arose when the sport fishery opened in Fish Creek on August 1. Debris thrown in the creek by the fishermen began to catch against the weir causing the water level to rise behind it by as much as two feet. Constant cleaning was necessary in order to prevent the weir from being washed out. The debris problem accompanied by water from frequent rains finally weakened the weir to a point where it washed out on August 9. Rather than attempt to put the weir back in, it was decided to close the site down for the season.

The reds were late in passing this year. Although they began to arrive at the mouth around July 7, they didn't move up to the weir until the 19th. Normally by this date 25 per cent of the run has already passed.

Total red escapement this season was over 26,000. A complete escapement tally is unavailable since there were still reds behind the weir when it washed out. A complete total for pinks and silvers is also lacking for the same reason. July 31 is used as the cut-off date when comparing escapement with other years. This would set the 1970 escapement at 19,881. Although this is about 3 times the escapement in 1969, it still indicates a downward trend in Fish Creek. Escapement for the predominant brood year 1966 was 41,312. The 1970 escapement is less than half this. The 1969 escapement displays about the same relationship with its predominant brood year.

There are probably myriad reasons why the red run into Fish Creek continues to decline. Commercial overfishing of the Fish Creek stocks is a very real possibility. Preliminary scale analysis shows a good portion of the reds taken on the east side beaches north of the Kenai River are headed for Fish Creek. This along with a heavy sport fishery in the creek itself plus illegally taken fish and the possibility of increasing pollution in Big Lake, the rearing area, could spell doom for Fish Creek reds. Comparative escapements by year are presented in Figure 4 and Table 7.

North and South Central Districts

The catch for the North and South Central districts since 1954 has averaged 67 per cent of the total Cook Inlet-Resurrection Bay catch. The 1970 catch was about normal with 65.4 per cent of the total catch taken in these two districts.

Of the total 2,214,730 salmon caught, 6,489 were kings, 662,574 sockeye, 189,175 coho, 603,319 pinks, and 753,173 chums (Table 8).

Fishermen of these districts received approximately 2,342,146 dollars for their catch based on average price paid per fish by species.

Nine emergency orders were issued in 1970 that affected fishing time of the North and South Central districts. As mentioned before, base time was set at three 12-hour fishing periods (Monday, Wednesday and Friday) prior to July 15 when three 16-hour periods were to go into effect.

Prior to July 8, sockeye catches and escapements were below average; therefore, the districts were closed for one 12-hour period Friday, July 8.

FIGURE 4. Red salmon escapement into Fish Creek, 1950-70

TABLE 7. Fish Creek red salmon escapements, 1938-1970. 1/

Year	Escapement	Year	Escapement
1938	182,463	1958	26,000
1939	116,558	1959	77,000
1940	305,982	1960 2/	80,000
1941	55,077	1961	40,000
1942	Poor	1962	60,000
1943	Fair	1963	105,000
1944	Good	1964	65,000
1945	Poor	1965	16,544
1946	57,000	1966	41,312
1947	150,000	1967	22,624
1948	150,000	1968	20,000
1949	68,240	1969	6,233
1950	29,654	1970	19,881 *
1951	34,704	1971	
1952	92,724	1972	
1953	54,345		
1954	23,287		
1955	37,000		
1956	42,663		
1957	15,630		

1/ Escapements from 1938-1959 were taken from U. S. Fish and Wildlife annual management reports.

2/ Escapements from 1960 to present are counts for the month of July only for comparative purposes and were collected by Alaska Fish and Game, Commercial Fisheries Division personnel.

* Total thru 8/8/70: 21,511 reds
3,940 pinks
1,048 cohos

TABLE 8. Salmon catch, By species, North and South Central Districts, 1954-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954	41,195	1,086,538	182,061	1,842,267	425,497	3,577,558
1955	25,404	974,601	124,412	98,454	208,022	1,430,893
1956	46,518	1,144,177	117,867	1,196,524	612,506	3,117,592
1957	20,831	553,281	81,018	19,550	900,016	1,574,696
1958	13,419	408,170	138,952	1,240,505	379,470	2,180,516
1959	19,426	471,966	61,619	10,506	239,134	802,651
1960	19,294	785,292	167,125	981,465	542,258	2,495,434
1961	11,982	1,084,929	76,803	23,252	288,525	1,485,491
1962	10,432	1,016,639	177,762	2,432,090	864,177	4,501,100
1963	10,191	833,517	133,600	21,496	343,333	1,342,137
1964	4,363	809,791	285,713	2,645,575	952,128	4,697,570
1965	9,441	1,380,775	131,717	19,049	299,538	1,840,520
1966	8,121	1,721,369	209,353	1,634,416	497,223	4,070,482
1967	7,675	1,261,997	133,875	23,769	258,453	1,685,769
1968	4,065	964,321	312,112	1,742,154	1,049,449	4,072,101
1969	9,494 ~~9,475~~	654,189 ~~653,436~~	80,527 ~~81,699~~	25,802 ~~26,339~~	258,019 ~~237,476~~	1,028,031 ~~1,008,425~~
1970	6,489	662,574	189,175	603,319	753,173	2,214,730
Total	268,321	15,813,373	2,604,863	14,560,730	8,850,378	42,097,665
17 Year Average	15,784	930,198	153,227	856,514	520,610	2,476,333
Per cent	0.6	37.6	6.2	34.6	21.0	100.0

A slight increase was noticed in escapements after this closure and fishing continued as scheduled in the districts until July; through this date sockeye escapements and catches were still lagging and it was decided to close the North Central district and the eastern half of the South Central district, Wednesday, July 15, for one 16-hour fishing period in an attempt to boost escapements into the Kenai and Kasilof Rivers.

Catches and escapements for sockeye through July 17 were still below average; therefore, an emergency order was issued effective Monday, July 20, to cut the scheduled 16-hour fishing period to a 12-hour period. By Thursday, July 24, strength of the sockeye run still appeared to be weak and the North and South Central districts were closed effective July 24, for one 16-hour fishing period.

The Department continued to monitor sockeye escapements through July 26, and all data indicated poor escapements; therefore, the Monday, July 27, fishing period was held to 12-hours instead of the 16-hour period. By this date the sockeye run was over.

Fishermen fished one 12-hour period on August 5, instead of the scheduled 16-hour period, beacuse of a poor showing of pink salmon; however, on that date catches of pinks were encouraging and fishermen were allowed another 12-hour period on August 6.

An emergency order was issued effective August 7, to keep the districts closed to allow a segment of east side pink salmon stocks to escape to the spawning grounds.

After reviewing all effort data through August 6, it was apparent that effort was about two-thirds reduced from the peak of the fishery and an emergency order was issued to allow fishing three days per week as scheduled in the 1970 commercial fishing regulations.

Sockeye have historically been the most valued fish in the gill net districts and Figure 5 depicts sockeye catches, by district from 1954-1970.

The Kenai, Kasilof and Russian Rivers are thought to be the major sockeye spawning systems of the North and South Central districts.

Sockeye escapements appeared to be poor for both the Kenai and Kasilof systems in 1970. Table 9 compares escapement data for the Kenai and Kasilof Rivers from 1960-1970. Indices for clearwater streams of the Kenai indicate the lowest escapement on record as was the case for the Kasilof system.

Total escapement to the Russian River is also the lowest recorded since 1960 (Table 9).

In comparing sockeye counts over the sonar system on the Kenai River, it appears that the timing of the run to this system was about two weeks late (Figure 6).

Timing of sockeye into the Kasilof appears similar to that of 1968 but about two weeks behind the 1969 run (Figure 7).

Comparing the timing of the Russian River sockeye to the eight year average for this system it looks as if the run was about a week behind schedule (Figure 8).

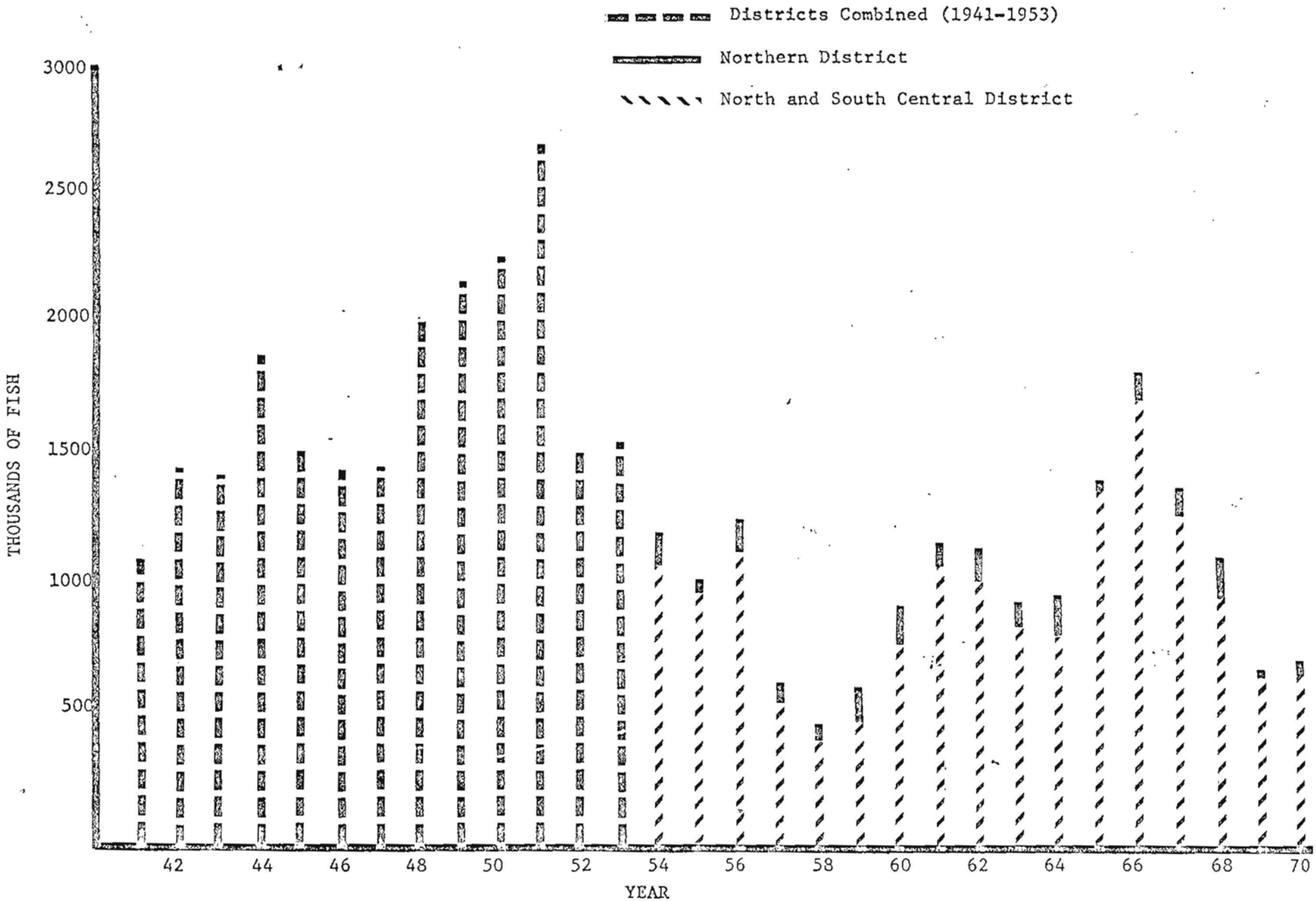

Districts Combined (1941-1953)
Northern District
North and South Central District
THOUSANDS OF FISH
3000
2500
2000
1500
1000
500
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
YEAR

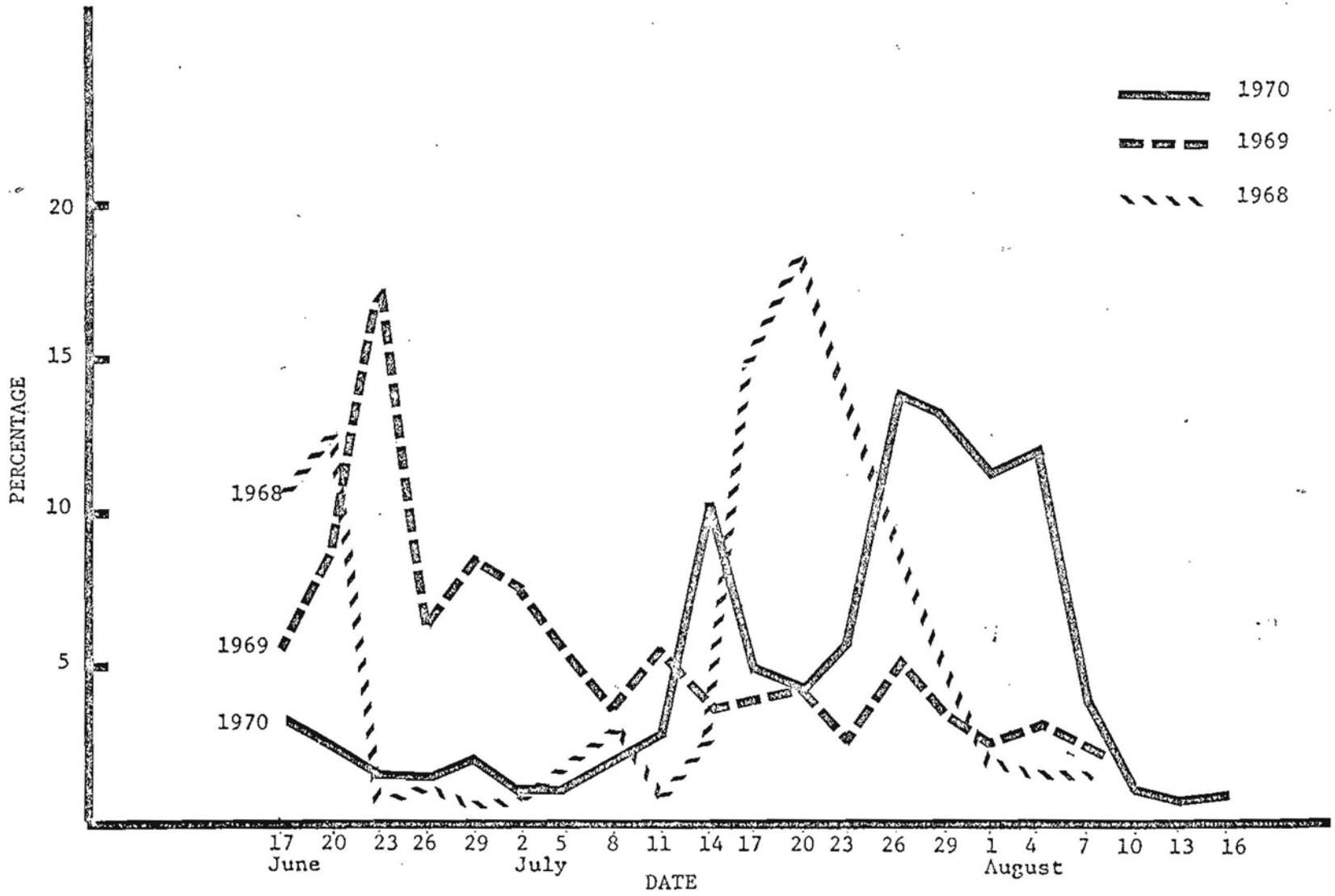
TABLE 9. Sonar estimates, peak survey count totals, and available weir counts of sockeye salmon in Cook Inlet spawning streams.

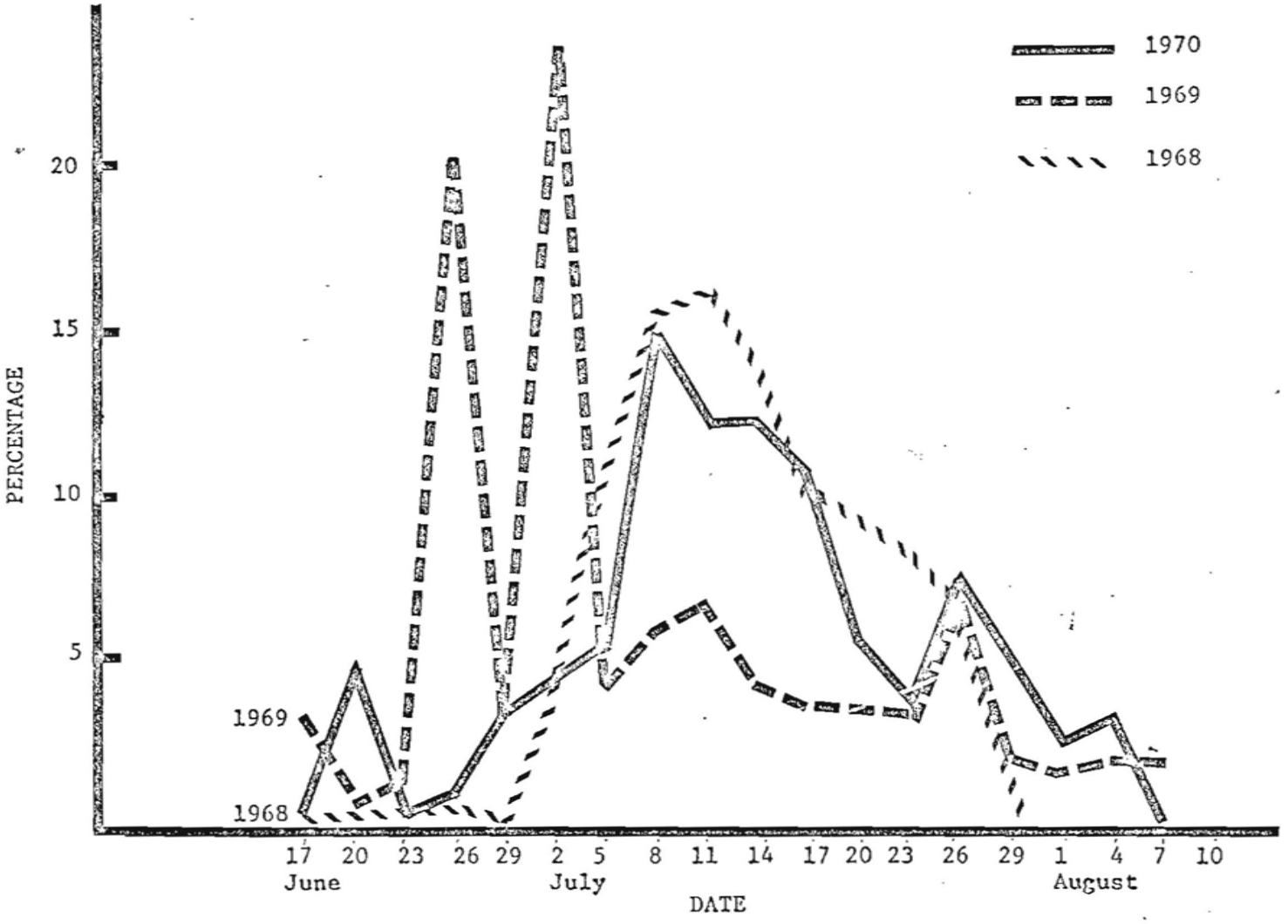
	Kenai		Russian		Kasilof	
Year	Sonar	Index	Late Run Esc.	Total 3/	Sonar	Index
1960			34,839 1/	43,954		
1961			18,669 1/	26,460		
1962			55,653 1/	60,353		
1963			51,100 1/	71,471		
1964			46,921 1/	66,558		
1965			21,459 1/	53,935		
1966		16,055	34,521 1/	73,256		32,886
1967		9,608	49,458 1/	75,302		21,442
1968	113,409	7,803	48,862 1/	70,766	92,708	41,406
1969	53,625	3,001	30,020 2/	43,342	45,588	18,400
1970	66,418	1,979	28,200 2/	40,001	37,240	16,719

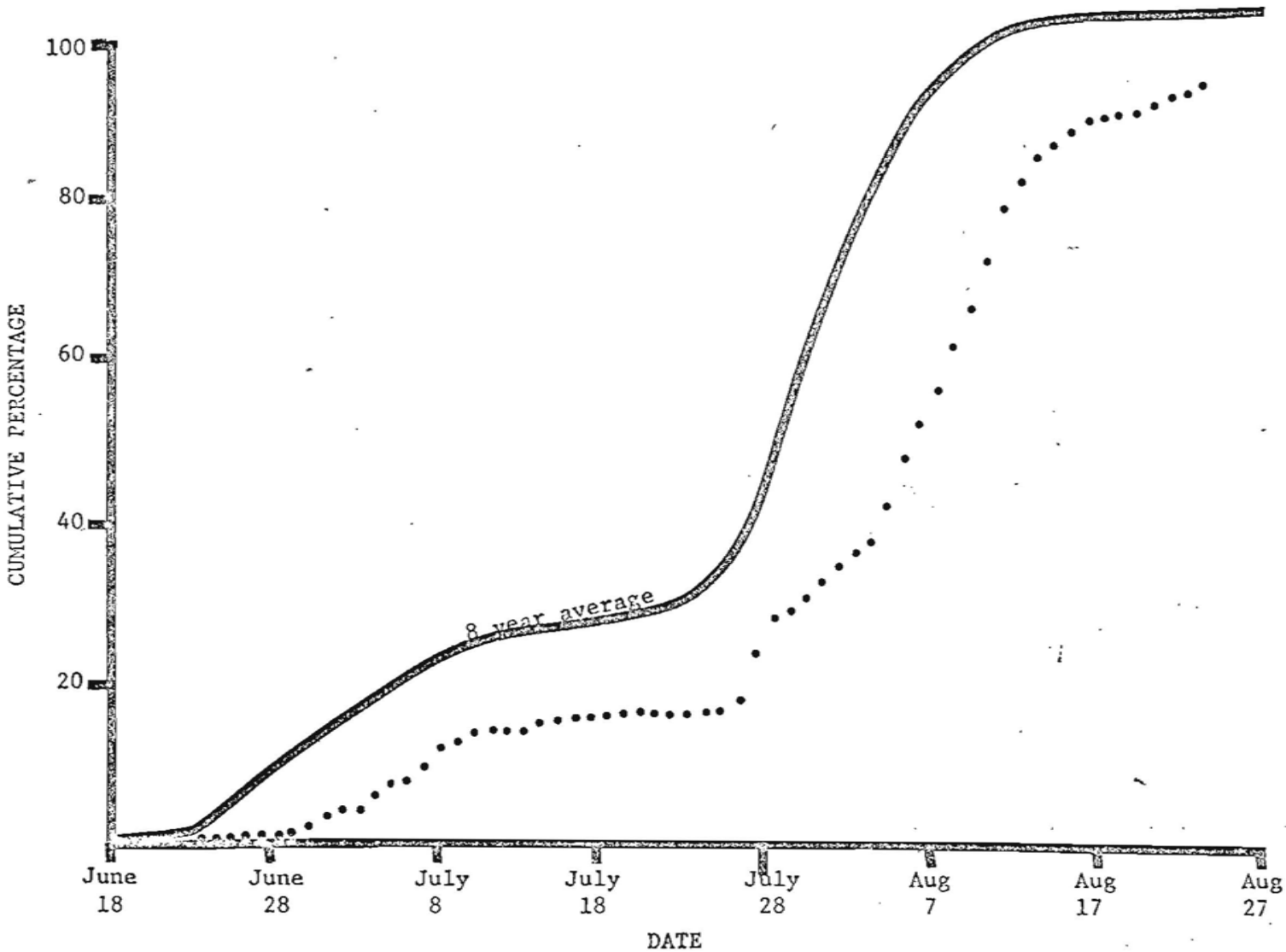
1/ Tower Counts (late run only)

2/ Weir Counts (late run only)

3/ Total of sportfish catch in Lower Russian River and Weir count.


1970
1969
1968
20
15
10
5
PERCENTAGE
1968
1969
1970
17 20 23 26 29 2 5 8 11 14 17 20 23 26 29 1 4 7 10 13 16
June
July
August
DATE


1970
1969
1968
PERCENTAGE
20
15
10
5
1969
1968
17 20 23 26 29 2 5 8 11 14 17 20 23 26 29 1 4 7 10
June
July
August
DATE


100
80
60
40
20
CUMULATIVE PERCENTAGE
8 year average
June 18
June 28
July 8
July 18
July 28
Aug 7
Aug 17
Aug 27
DATE

The major problem areas concerning management of these two districts are as follows:

(1) Obtaining escapement counts into the major spawning areas immediately after salmon leave the fishery.

(2) An over abundance of drift and set gill net gear.

(3) Fishing on mixed stocks of salmon of all species, this is particularly true of the drift fleet..

Southern District

The total salmon catch for the Southern district in 1970 was 232,389 and accounted for 6.9 per cent of the total Cook Inlet catch. (Table 10). Pink salmon contributed 89.58 per cent of the catch, followed by red (5.27 per cent), chums (3.52 per cent), cohos (1.59 per cent), and kings (.03 per cent). The 1970 salmon catch and percent by species, by district, appears in Table 11. The 1970 pink catch was the highest since 1964. The pink salmon catches since 1964, depicting the even-odd years fluctuation, are shown in Figure 9.

The season opened on June 2 for both seines and gill nets. There was very little activity on pink salmon until the week of June 28 when about 11,000 pinks were harvested. The run developed steadily and peaked the week of July 26 when 59,000 pinks were taken. The run was over by the 20th of August. The salmon catch, by week, for the Southern, Outer and Kamishak districts appears in Table 12.

A little more than one-half of the total pink salmon catch was harvested in upper Kachemak Bay in statistical areas 241-13,14 and 15. The bulk of these fish were bound for Humpy Creek in Mallard Bay.

TABLE 10. Salmon catch, by species, Southern District, 1954-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954	1,532	22,913	12,235	180,977	150,769	368,426
1955	562	30,848	3,230	565,216	24,398	624,254
1956	310	33,054	4,693	150,486	53,515	242,058
1957	286	19,431	1,507	130,511	57,403	209,138
1958	119	17,731	1,713	209,798	24,096	253,457
1959	74	10,026	709	50,076	15,278	76,163
1960	12	12,292	1,237	250,818	4,100	268,459
1961	39	10,180	1,161	191,911	2,924	206,215
1962	58	16,569	2,095	564,050	9,089	591,861
1963	88	13,142	4,020	99,829	7,695	124,774
1964	84	17,283	8,905	266,489	11,529	304,290
1965	10	11,229	733	90,330	2,459	104,761
1966	60	12,192	4,535	177,544	28,754	223,085
1967	173	26,350	2,393	95,100	23,416	147,432
1968	61	18,716	4,671	154,033	4,518	181,999
1969	59	12,578	~~519~~ 485	~~70,878~~ 70,753	~~2,588~~ 2,600	~~86,616~~ 86,475
1970	91	12,245	3,705	208,174	8,174	232,389
Total	3,618	296,779	58,055	3,456,220	430,705	4,245,377
17 Year Average	213	17,458	3,415	203,307	25,335	249,728
Per cent	0.09	6.99	1.37	81.41	10.15	100.0

TABLE 11. 1970 Salmon catch and percent by species, Southern, Outer and Kamishak Districts, Cook Inlet.

District	Kings	Percent	Sockeye	Percent	Cohos	Percent	Pinks	Percent	Chums	Percent	Total
Southern	91	.03	12,245	5.27	3,705	1.59	208,174	89.58	8,174	3.52	232,389
Outer	5	*	4,177	.98	243	.06	302,879	71.09	118,746	27.87	426,050
Kamishak	0	.00	2,888	2.36	220	.18	23,583	19.24	95,857	78.22	122,548
Total	96	*	19,310	2.47	4,168	.53	534,636	68.46	222,777	28.53	780,987

* Less than one per cent.

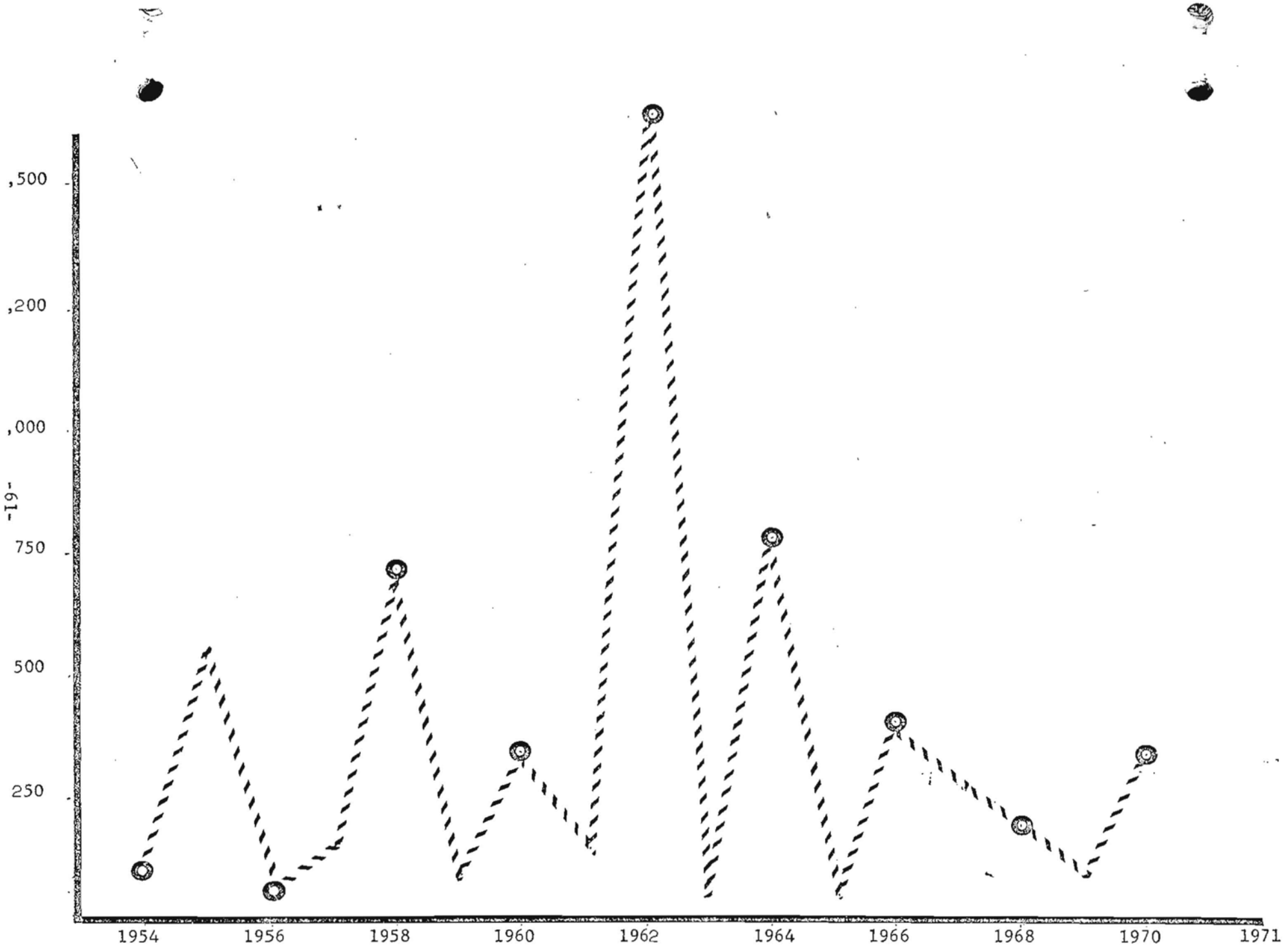


Figure 9. Pink salmon catches, ~~Outer~~ District, Cook Inlet, 1954 - 1970

TABLE 12. 1970 Salmon catch by week, Southern, Outer and Kamishak Districts

WEEK	Southern District			Outer District			Kamishak District		
	PINKS	CHUMS	REDS	PINKS	CHUMS	REDS	PINKS	CHUMS	RE
23	-	-	124	-	-	-	-	-	
24	2	4	488	-	-	-	-	-	
25	63	183	3,875	-	-	-	-	-	
26	1,053	638	1,917	-	-	-	-	-	
27	11,326	1,018	3,323	-	-	563	-	1,261	1,7
28	17,832	925	2,382	691	396	263	-	-	2
29	33,130	2,294	1,491	6,068	314	997	5,335	1,097	
30	36,661	481	740	137,047	35,943	131	2,204	3,369	
31	58,951	1,310	248	101,159	53,034	20	11,109	16,313	
32	26,386	1,263	206	50,289	17,855	5	2,313	22,920	
33	17,083	46	78	7,482	10,609	14	1,110	33,107	
34	5,350	-	-	12	595	-	22	7,378	
35	-	-	-	-	-	-	4	9,153	

The catches in Seldovia, Tutka Bay, and Port Graham were weaker than anticipated and less than one hundred thousand pinks were harvested in these three areas combined.

The pink salmon escapement for the four major streams of the Southern district totaled 100,300. Two systems, Humpy Creek and Port Graham were above the 9 year average escapement while Tutka Bay and Seldovia fell below the average. The 1970 pink salmon escapement, by date, for the four major streams is presented in Table 13. There are other minor pink salmon streams in the Southern district at Barbara Point, Jackolof Bay, Sadie Cover, Halibut Cove Lagoon, Bradley River and Fox River which contribute to a minor degree to the total pink salmon production in this district. Chum salmon escapment was good in the Port Graham area, however, was weak for the remainder of the district.

The first emergency order affecting the Southern district closed the Kachemak Bay area east of Jakolof Bay to commercial salmon fishing for seine gear and was effective July 16. Justification was lack of escapement in this area. By July 21, pink salmon escapement had picked up at Tutka Bay stream and Humpy Creek and thus on July 23 the closed portion of the Southern district was re-opened to salmon fishing. The third and final emergency order issued for the Southern district was effective Auaust 10 and closed the Port Graham area to all commercial salmon gear. The justification for this order was that salmon escapement was lagging for the time of year.

TABLE 13. 1970 Southern District, pink salmon escapement by date. 1/

	Humpy		Tutka		Seldovia		Port Graham	
	Stream	Intertidal	Stream	Intertidal	Stream	Intertidal	Stream	Intertidal
6-8								
July 1-2						300		
3-4								
5-6						1600		
7-8	500			200		130		
9-10								
11-12								
13-14	~~581~~		2					
15-16							1,000 2/	800 2/
17-18								
19-20	5,500		2	40	300	1,000		
21-22								
23-24	13,550	2,500		300 2/			2,100 2/	1,400 2/
25-26								
27-28			30	740	1,800	4,040		
29-30	22,000	3,000						
31-1								
Aug. 2-3								
4-5			50	1,700				
6-7							8,000	
8-9								
10-11								
12-13					3,800	8,600		
14-15								
16-17								
18-19	36,220	1,500						
20-21								
22-23								
24-25			500	4,000				
26-27							5,700	500
28-29								
30-31								
Sept. 1-2	7,000							
3-4					1,000	1,800		
5-6								
7-8								
9-10								

1/ Counts derived from ground surveys
2/ Aerial counts

Outer District

The total salmon catch for the Outer district in 1970 was 426,050 and accounted for 12.5 per cent of the total Cook Inlet catch, Table 14.

The pink salmon catch was 302,879 and comprised 71.09 per cent of the total catch. Chums accounted for 27.87 per cent of the catch reds, .98 per cent; and cohos, .06 per cent; Table 11.

The pink salmon catch was the largest since 1966. The main area of return was the Port Dick area where 195,049 pinks were harvested. The remainder of the catch came primarily from the Nuka area (Nuka Passage, Nuka Island, and Nuka Bay) and from the Rocky Bay area. The pink salmon catches for the Outer district from 1954 to 1970 are shown in graphic form in Figure 10. The chum salmon catch was the best since 1964. The Nuka and Rocky Bay areas accounted for 75.67 per cent of the catch. The Port Dick area contributed 18.40 per cent of the catch.

The Red salmon catch was also the highest since 1962. The bulk of the reds were harvested in Aialik Bay. The catch, by week, for pinks, chums, and reds is shown in Table 12.

The following emergency orders were issued for the Outer district during the 1970 season:

No.	Effective Date	Area Affected	Action
1	July 9	Harrington Point East	Open Area
2	July 16	Dogfish Bay	Open Area
3	July 23	Port Dick Area	Open Area
4	July 27	Entire Outer District	Open Area
5	July 30	Port Dick Area	Closed Area
6	Aug. 4	Port Dick Area	Open Area
7	Aug. 6	Port Dick Area	Closed Area

TABLE 14. Salmon catch, by species, Outer District, 1954-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954	13	4,927	369	82,205	112,877	200,391
1955	7	701	277	557,997	40,887	599,869
1956	23	2,889	190	42,368	19,248	64,718
1957	13	2,982	110	149,197	138,171	290,473
1958	1	1,719	83	739,768	100,386	841,957
1959	3	10,365	109	68,875	65,675	145,027
1960	4	1,336	533	328,501	67,187	397,561
1961	2	12,595	444	105,447	40,204	158,692
1962	2	8,697	1,893	1,684,023	126,750	1,821,365
1963	6	1,974	369	21,462	116,923	140,734
1964	2	1,370	431	767,396	269,512	1,038,711
1965	0	1,965	7	21,816	22,443	46,231
1966	1	2,710	357	398,751	87,620	489,439
1967	2	2,165	56	259,951	37,533	299,707
1968	1	1,550	106	191,691	20,283	213,631
1969	0	92	11	51,533	5,400	57,036
1970	5	4,177	243	302,879	118,746	426,050
Total	85	62,214	5,588	5,773,860	1,389,845	7,231,592
17 Year Average	5	3,660	329	339,639	81,756	425,388
Per cent	0.001	0.86	0.08	79.84	19.22	100.0

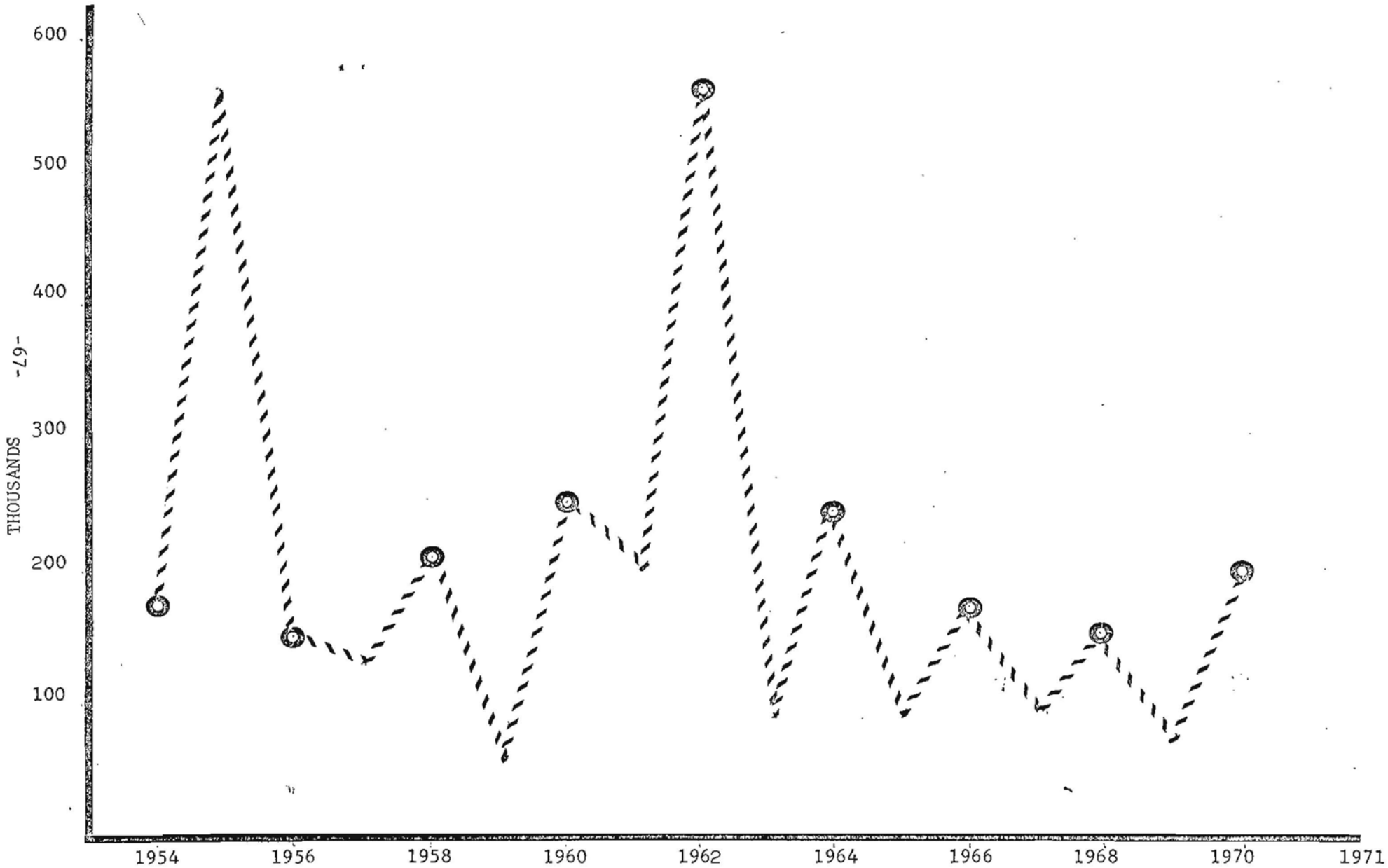


Figure 10. Pink Salmon catches, ~~Southern~~ Outer District, Cook Inlet, 1954 - 1970.

The pink salmon escapement for five of the major systems of the Outer district was 98,300. There are several other streams which contribute to the pink production in this district. The major one is located at the south end of Nuka Island and pink escapement into this stream in 1970 was approximately 20,000. The pink salmon escapement, by date, for the four study streams appears in Table 15.

Chum salmon escapement was good in the Port Dick area and at Rocky, Windy Right, and Dogfish Lagoon. Chum salmon escapement by system and by date for the Outer district appears in Table 16.

Kamishak District

The total 1970 Kamishak district salmon catch of 122,548 was the third highest since 1954, exceed only by the 1968 and 1969 catches. The chum salmon catch of 95,857 was the highest on record and made up 78.22 per cent of the total catch. The major area of return was Cottonwood Bay.

The pink salmon run to the Kamishak district was disappointing as was the case for the other Cook Inlet districts and most areas in the state. The total pink catch was 23,583, Table 17.

The red catch was 2,888 and the bulk of these were harvested by two vessels fishing illegally in the closed Chenik area. These fish were harvested during the last week of June and first week of July when the McNeil area was open.

TABLE 15. 1970 Outer District, pink salmon escapement, by date. 1/

		Port Dick		Rocky		Windy Left		Windy Right	
		Stream	Intertidal	Stream	Intertidal	Stream	Intertidal	Stream	Intertidal
July	1-2								
	3-4								
	5-6								
	7-8								
	9-10								
	11-12								
	13-14								
	15-16	3250 C	12000 I. Bk.	80 2/					200 2/
	17-18	700 P							
	19-20	1,500 P	5000 C						
	21-22	2,500 I	250 P	550 2/					30 2/
	23-24	4,100 P	5000 C 500 P				130 2/	500 2/	50 2/
	25-26			6,580	500				
	27-28	5000 C	10000 P			75 2/	3,500 2/	1,500 2/	
	29-30	3,200 P	1,500						
	31-1	10,800 P	3500 C 5,860						
Aug.	2-3			8,300 2/	3,700 2/	3,500 2/	200 2/	1,000 2/	1,000 2/
	4-5								
	6-7	10,200 I	8,000 I		4,500 2/	5,500 2/		1,500 2/	
	8-9								
	10-11	2900 C				13,000		2,100	
	12-13			24,000					
	14-15	10,000 I	8,700						
	16-17								
	18-19								
	20-21								
	22-23								
	24-25	10,300 P	3000 C 12,000						
	26-27								
	28-29								
	30-31								
Sept.	1-2								
	3-4								
	5-6								
	7-8								
	9-10								

1/ Counts derived from ground surveys

TABLE 16. 1970 Outer District chum salmon escapement by date. 1/

Date		Port Dick	Middle Creek	Island Creek	Rocky River	Windy Right	Port Chatham 3/	Dogfish 3/	Port Graham	Windy Left
July	1-2									
	3-4	100 2/								
	5-6	400 2/	100 2/							
	7-8									
	9-10									
	11-12									
	13-14	1.000 2/								
	15-16	3,250	230 2/	~~350~~ 2/		1,200 2/	900 2/	2,000 2/	2 600 2/	
	17-18			500						
	19-20	5,000	226							
	21-22			1,000	150 2/	2,000 2/	1,300 2/	2,500 2/		
	23-24	5,000								130 2/
	25-26				1,775					
	27-28	5 000 2/	450 2/			2,000 2/	3,100 2/	4 900 2/	2,600 2/	500 2/
	29-30			3,700						
	31-1	3,500								
Aug.	2-3		900 2/		3,000 2/					
	4-5									
	6-7		185	4,900				5,000 2/	250	
	8-9									
	10-11	2,900			4 500	500				1,000
	12-13									
	14-15									
	16-17									
	18-19									
	20-21									
	22-23		100	8,500						
	24-25	300							100	
	26-27									
	28-29									
	30-31									

1/ Counts derived from ground surveys.
2/ Aerial counts.
3/ Total of all streams in system.

TABLE 17. Salmon catch, by species, Kamishak District, 1954-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954			No Fishery			
1955		2	8	5,121	278	5,409
1956		67	701	193	14,936	15,897
1957		4,335	29	5,905	10,856	21,125
1958			No Fishery			
1959		1,549	43	5,325	25,759	32,676
1960	11	768	28	11,563	44,328	56,698
1961		1	14	6,019	12,465	18,499
1962		20	11	219	6,058	6,308
1963	1	4	97	82,314	13,892	96,308
1964	5	1,979	115	20,719	42,280	65,098
1965		808	4	3,452	2,706	6,970
1966		21	247	2,945	12,688	15,901
1967	1	182	74	17,340	24,221	41,818
1968		492	101	198,253	49,461	248,307
1969	2	10,723 ~~10,272~~	121 ~~4,094~~	80,157 ~~76,459~~	53,193 ~~52,936~~	144,196 ~~144,218~~
1970		2,888	220	23,583	95,857	122,548
Total	20	23,388	5,786	459,410	408,721	897,780
15 Year Average		1,559	386	30,627	27,248	59,852
Per cent		2.66	0.64	51.17	45.53	100.0

The following emergency orders were issued for the Kamishak district during the 1970 season:

No.	Effective Date	Area Affected	Action
1	June 27	Nordyke Island South	Open Area
2	July 29	Ursus Head South	Open Area
3	Aug. 5	Ursus Head North	Open Area
		Ursus Head to Nordyke Island	Closed Area
4	Aug. 14	Bruin Bay	Open Area
5	Aug. 21	Ursus Bay	Open Area

Escapement is extremely difficult to monitor in the Kamishak Bay district due to weather, location, and size of area. Due to the physical problems of the area and lack of personnel there have been no ground escapement surveys conducted in the past. Aerial surveys have been done with larger planes, such as, the Cessna 185 and Grumman Goose. Under ideal conditions it is possible to get distribution and pin-point areas of high abundance; however, it is difficult to obtain actual estimates of escapement. (Aerial estimates by date for the Kamishak district are presented in Table 18).

EASTERN DISTRICT

The Eastern district is the least important commercial salmon producing district in the area. Fishermen landed 43,330 salmon in 1970, of these 40,227 were pinks, 1,767 sockeye, 692 coho, 633 chum and 11 kings (Table 19).

Based on a 14 year average it has contributed about 1.1 per cent of the total Cook Inlet catch. This percentage would be less if it had not been for the food catches of sockeye in 1968 and 1969, 74,500 and 99,099 respectively. The 1968 and 1969 sockeye catch was the result of

TABLE 18. 1970 Kamishak District, aerial stream surveys [1/] by species. [2/]

Date	Mikfik	McNeil	Little Kamishak	Amakdedori	Bruin [3/]	Sunday	Ursus [3/]	Cottonwood	Iniskin
6-18-70	200 R [4/]								
6-20-70	700 R [4/]								
6-24-70	300 R [4/]			100 R					
7- 1-70	350 R [4/]								
7-14-70	30 R	1,000 C		250 R	300 P	40 P	1,500 P		
8- 3-70		350 C	2,000 P	2,500 P	7,500 P	2,000 P	5,200 P	550 C	350 P
8-12-70				13,000 P	40,000 P		23,000 P		
8-19-70	200 S [4/]								

1/ All surveys conducted with a Cessna 185.
2/ R = Red Salmon P = Pink Salmon C = Chum Salmon S = Silver Salmon
3/ Counts are total for all streams within bay.
4/ Ground survey.

Table 19. Salmon Catch by species, Eastern District, 1954-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954	0	11,786	2,556	7,562	1,945	23,849
1955	4	5,049	6,160	55,994	3,147	70,354
1956	0	296	3,761	14,873	519	19,449
1957	120	169	119	0	20	428
1958	0	0	0	200	0	200
1959	58	5,477	8,954	125	14,612	29,226
1960	0	105	853	8,720	467	10,145
1961			No Fishery			
1962	0	0	3,728	49	10	3,787
1963	1	1	2,250	11	0	2,263
1964	0	22	22	813	12	869
1965			No Fishery			
1966			No Fishery			
1967	0	348	203	3,097	275	3,923
1968	2	74,484	5	41,464	872	116,827
1969	3	99,403 ~~99,109~~	6	1	10	99,423 ~~99,129~~
1970	11	1,767	692	40,227	633	43,330
Total	199	198,613	29,309	173,136	22,522	423,779
14 Year Average	14	14,186	2,094	12,367	1,609	30,270
Per cent	1	47	7	41	5	100.0

good returns from the 1964 brood year. In that year Bear Lake was rehabilitated and survival conditions were evidently close to ideal for the progeny.

There were four emergency orders issued in 1970 for the Eastern district fishery. The 1970 commercial fishing regulations called for the drift gill net season to be opened and closed by emergency orders.

The first emergency order was effective June 24 and opened the district to seven days per week fishing. The reason and justification for this order was as follows. Prior to June 22, the Homer area office had been informed that Bear Lake would not be rehabilitated in 1971, therefore, knowing that the 1970 predicted that return was less than 5,000 salmon we wanted to make sure that escapement to the Bear Lake system was assured before opening the district to commercial fishing. However, on June 23, the Homer office received a call from the Sport Fish Divisions Area Biologist, informing the commercial fisheries staff that plans had changed and Bear Lake would definitely be rehabilitated, therefore, an emergency order (No 1-70) was issued opening the district to seven days per week fishing commencing Wednesday, June 24, at 6:00 a.m. in order to obtain a maximum harvest of sockeye.

Prior to June 29, another call was received from the Sports Fish Division and the Homer staff was informed that plans had changed again and that Bear Lake would not be rehabilitated. In order to assure escapement and maintain the genetic strain of Bear Lake Sockeye the second emergency orders for the season was drafted to close the Eastern district to drift gill net fishing effective Tuesday, June 30, 1970 at 6:00 p.m.

On even years; that is, 1968, 1970 etc., pink salmon return to the area in greater abundance than odd-years and usually a seine fishery is warranted to harvest the surplus. The seine fishery usually commences July 1 and for all practical purposes in over by the third week of July.

In 1970 the seine season was set for July 1 through July 31 and the pink salmon catch up through July 31 was 19,149. However, on August 5 the department received a call from Mr. Val Anderson that there was a large concentration of pink salmon in Resurrection Bay and in his opinion, spawning systems of the area had adequate pink salmon escapement. The department verified this report through Mr. Ted McHenry, Sport Fish biologist, Seward, and asked if silver salmon were beginning to enter the area; in his opinion there was a surplus of pink salmon for harvest and significant numbers of silver salmon had not entered the district. Therefore, on August 5 an emergency order was issued to open the Eastern district to hand purse seines only for one 36-hour period from Thursday, August 6, at 6:00 a.m. to Friday, August 7, at 6:00 p.m.

On August 6, at 4:00 p.m. the Homer secretary received a call from Mr. Jim Larsen, KENI radio; in essence, he informed her that commercial fishermen were taking large numbers of silver salmon and the pink fishery would have harmful effects on the "Seward Silver Salmon Derby" scheduled to commence Saturday, August 8.

The department disagreed with Mr. Larsens observation based on observations made by Dan Hennick, commercial fisheries biologist based in Seward. On August 6, Hennick reported to the Homer office late in the

afternoon that he had monitored the fishery all day, that ten boats were fishing a few chums. He had not observed any silver salmon in the catch.

However, public emotion was running high and late on the evening of August 6, an aide from the Governors office informed the Commissioner of Fish and Game to close the Eastern district fishery no later than 12:00 noon August 7, to prevent any further public discontent. Therefore, an emergency order was issued August 6, to close all commercial salmon fishing effective Friday, August 7, at 12:00 noon, six hours prior to the scheduled closure. It is interesting to note that fishermen caught 23,849 pink salmon in 30 hours of fishing or 57 per cent of the total pink salmon catch was taken during the August extension. Further, there were less than 100 silvers harvested commercially.

SHELLFISH FISHERY

KING CRAB MANAGEMENT AREAS

The Cook Inlet area is divided into three basic king crab management areas. These are the Southern, Kamishak, and Outer districts (Figure 2).

The average king crab catch by district since 1960 is as follows:

The Southern district, or, Kachemak Bay area -- 2.0 million pounds,

the Kamishak district -- 2.7 million pounds, and

the Outer district -- 130 thousand pounds.

The total Cook Inlet crab catch for these districts since 1960 has ranged from a high in 1963 of 8.4 million pounds to a low in 1965 of 2.8 million pounds (Table 20). The average catch since 1960 is about 5 million pounds. Most of the discussion in this report will center around the Southern and Kamishak districts as the catches in the Outer district have been relatively insignificant.

Figure 11 shows the king crab catches and landings by year in Kachemak Bay. There has been a gradual decline in this fishery since the early 60's when catches in the 3 million pound class were made. In 1964, after the earthquake wiped out the Kodiak crab fleet, many Cook Inlet boats transferred to Kodiak, and as a result, the catch in 1964 fell far below the 1963 level. Effort has never returned to the level it was at prior to the quake although the boats and gear now being used are more efficient. Since 1965, there have been less than one thousand landings

TABLE 20 Cook Inlet king crab catch in pounds, by district, 1951-1970.

Year	Kachemak	Kamishak	Outer	Eastern	Total
1951	6,619				6,619
1952	2,900				2,900
1953	1,359,854				1,359,854
1954	1,275,852				1,275,852
1955	1,915,821				1,915,821
1956	2,129,035				2,129,035
1957	620,858				620,858
1958	752,990				752,990
1959	2,191,437				2,191,437
1960	4,219,776		67,656		4,287,432
1961	2,988,880	1,205,679	61,837		4,256,396
1962	1,968,980	4,305,444	577,197		6,851,621
1963	2,667,279	5,538,349	175,535		8,381,163
1964	1,760,660	4,967,824	43,908		6,772,392
1965	1,813,135	963,412			2,776,547
1966	1,887,948	1,974,559	37,656		3,900,163
1967	1,286,789	1,821,269	16,033	418	3,124,509
1968	1,004,163	2,965,658	39,112		4,008,933
1969	1,303,655	1,422,587	130,928		2,857,170
1970	1,495,759	2,237,259	149,784		3,882,802

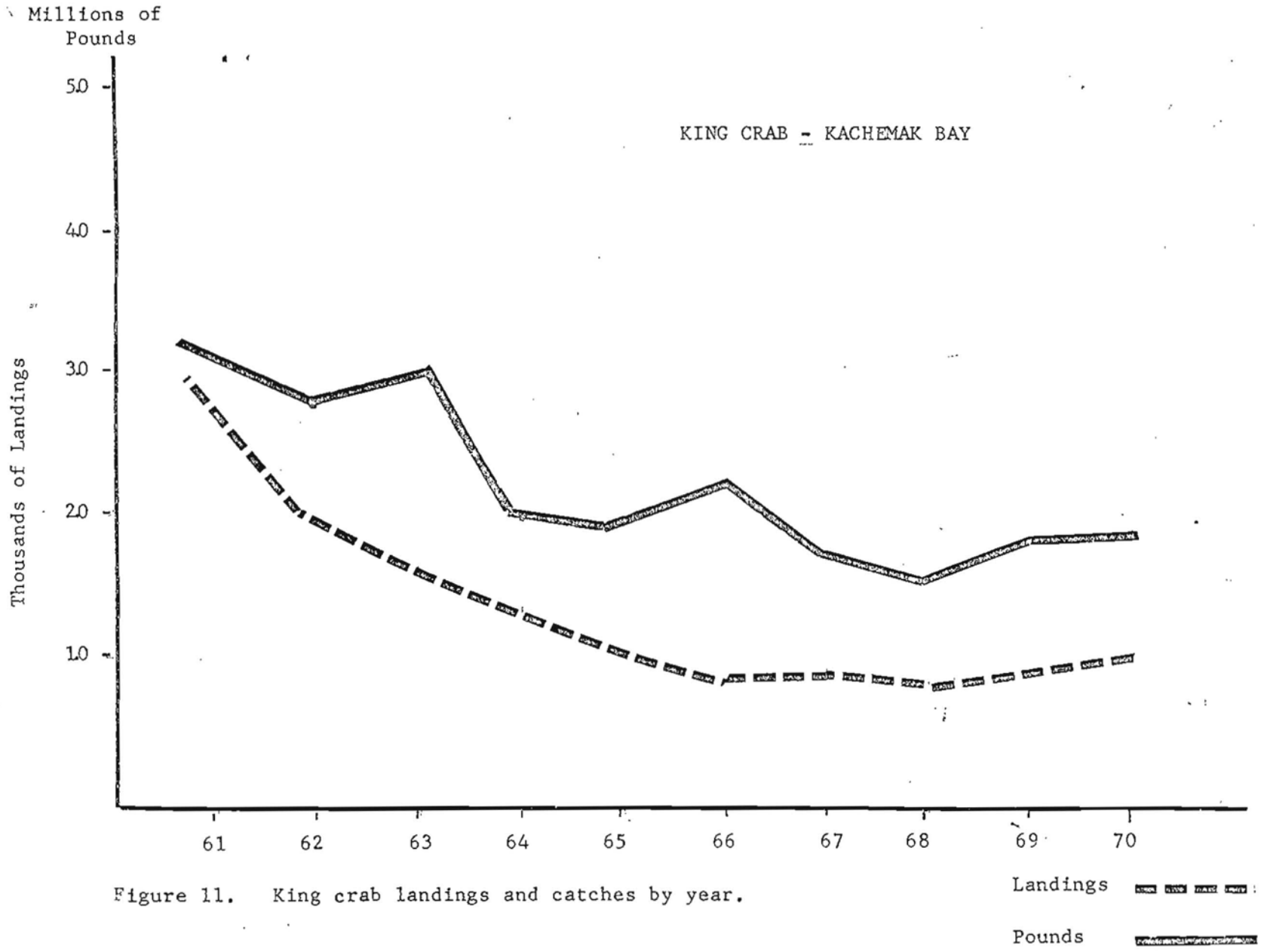


Figure 11. King crab landings and catches by year.

annually in this area -- the range has been from 659 landings in 1968 to 742 landings in 1965. The catch has also remained relatively constant and has ranged from 1 million pounds in 1968 to 1.9 million pounds in 1966.

Figure 12 shows the king crab catch and landing by year for the Kamishak Bay district. The highest years of production were 1962, 1963, and 1964 when catches exceeding 4 million pounds were made. Effort dropped tremendously in 1965 when many of the boats went over to fish Kodiak. Since 1965, the fishery has had its ups and downs and this has been due mainly to effort. The lowest catch occured in 1965 when 79 landings were made, while the highest catch was made in 1963 when 445 landings were made. The best catch in recent years was made in 1968 when 177 landings resulted in a 3 million pound harvest.

In Kachemak Bay, landings have remained fairly constant since 1965. The number of crab per landing has ranged from a low of 195 in 1968 to a high of 332 in 1966. This past year the number of crab per landing was 295 which is the highest since 1966. There has been a tendency toward more efficient boats and gear; however, the small boat fishery in Kachemak Bay has remained relatively unchanged during the past five years and the number of crab per landing is a useful index of stock assessment.

In the Kamishak area, landings have ranged from a low of 66 in 1969 to a high of 445 in 1963. The number of crab per landing has ranged from a low of 776 in 1961, the first year of the Kamishak fishery, to a high of 2,709 in 1969. (Table 21).

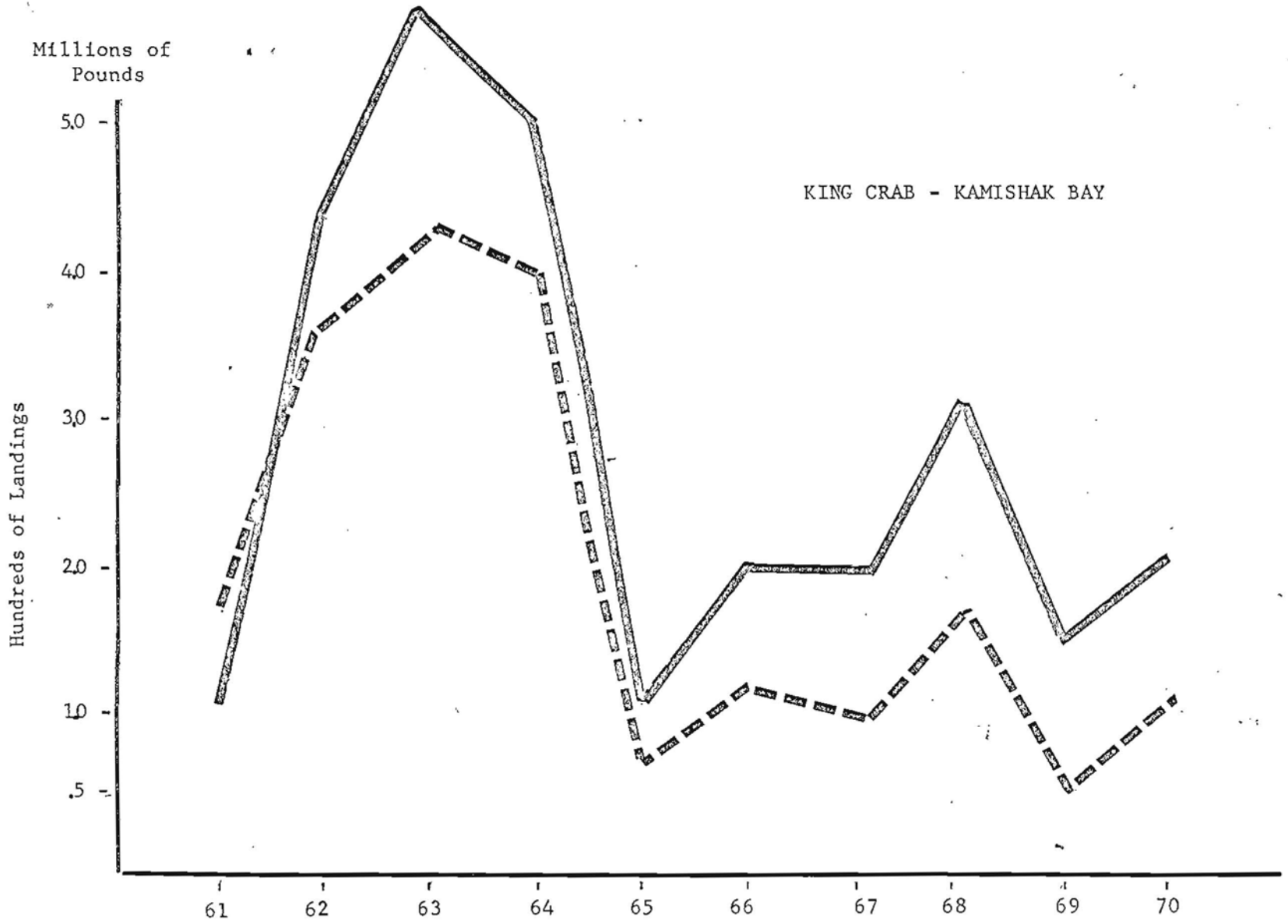


Figure 12. King crab landings and catches by year.

TABLE 21 Cook Inlet king crab catch per landing, 1960-1970.

Year	Landings	Crab	Crab per landing	Total Pounds
			Southern District 1]	
1960	2434	455,000	187	4,219,776
1961	2619	364,045	139	3,108,352
1962	1843	296,123	160	2,546,177
1963	1435	347,096	241	2,842,814
1964	1019	229,165	225	1,804,568
1965	742	217,544	293	1,787,420
1966	681	226,557	332	1,925,604
1967	705	164,335	233	1,303,240
1968	659	128,720	195	1,043,275
1969	681	196,350	288	1,434,583
1970	716	224,373	313	1,645,543
			Kamishak District	
1960	None			
1961	181	140,566	776	1,215,766
1962	372	473,601	1273	4,305,444
1963	445	635,225	1427	5,538,349
1964	401	589,796	1470	4,967,824
1965	79	108,019	1367	963,412
1966	121	225,537	1863	1,974,559
1967	99	213,285	2154	1,821,269
1968	177	331,439	1873	2,965,658
1969	66	178,825	2625	1,422,587
1970	106	276,807	2611	2,237,259

1] Outer District data included.

Establishment of Quota

At the spring Board of Fish and Game meeting in 1969, a king crab quota was established for the Cook Inlet area. One of the prime reasons for the establishment of the quota was the desire to maintain a stable catch and prevent excessive stock exploitation. The Cook Inlet staff did not have the biological data needed -- such as, stock strength, migration patterns, and recruitment -- to recommend a sound quota level. However, we did have past catch data by district, by year, and this was used as a guide in establishing the quota level. The average catch for the preceeding nine years was used as the starting point.

The quota for the total Cook Inlet area was thus set at 4.5 million pounds with 2.0 million assigned to the Southern district and 2.5 million pounds to the remainder of Cook Inlet. The season for the Cook Inlet area was set for August 1 through the end of February. The closure which runs from March 1 to July 31 was established to protect stocks during the season when crab are moulting and spawning and generally in poor condition. Fishing ground surveys in past years have consistently shown early March to be the time when large numbers of female and softshell crab appear in the catches. This, of course, coincides with the timing of the crab migration to shallow waters for the purpose of spawning.

For the purpose of this annual report, the following discussion on catch is for the calender year and not the quota period.

1970 Catch

The 1970 total catch of king crab in Cook Inlet was 3,882,802 pounds and exceeded the 1969 catch by nearly 1 million pounds. Catches by district, by year, since 1951 appear in Table 20. The 1970 Southern district (Kachemak Bay) harvest was 1,495,759 pounds which was the highest since 1966. The peak month of production was August when 1,016,561 pounds (67.96 percent) were taken. The catch by month from 1963-1970 appears in Table 22. August was also the peak month of effort with 365 landings made in the Southern district (Table 23). The total Kamishak district catch was 2,237,259 pounds and was about one-half million pounds below the average from the past 10 years. The monthly catch was distributed more evenly in the Kamishak district with the highest months of production occurring in August, September, and October. Effort in Kamishak ranged from 5 landings in December to 23 landings in September (Table 23). The Kamishak district, for the purpose of king crab management, includes all Cook Inlet waters south of the latitude of Anchor Point and west of the longitude of the western most point of Ushagat Island, which is in the Barren Islands.

Observer Program

An observer program was initiated in August. The initial goal of the program was for the observer to make one trip per month to each of the major fishing areas. The data collected included fishing location, depth fished, and the complete catch composition by pot. A summary of the data

TABLE 22 Cook Inlet king crab catch in pounds, by month, 1963-1970.

Month	1963	1964	1965	1966	1967	1968	1969	1970
January	156,697	165,752	123,228	60,189	20,456	38,095	80,678	169,305
February	847,221	336,459	52,019	318,031	149,861	368,975	162,827	446,582
March	449,132	526,354	626,006	255,749	324,234	937,176		
April	587,187	733,497	372,276	580,428	580,984	363,742		
May	628,420	411,023	220,572	502,257		563		
June	1,791,634	776,858	252,311	632,303				
July	1,808,687	2,083,318	507,765	652,339	893,904			
August	1,078,313	1,164,270	523,125	530,513	816,891	1,153,828	1,178,224	1,586,635
September	638,258	345,781	72,179	226,607	247,822	638,954	1,042,398	755,980
October	243,065	148,703	1,018	14,746	69,179	332,890	292,853	478,644
November	34,912	47,827	9,137	55,978	11,788	109,371	8,045	328,209
December	117,637	32,550	16,911	71,023	9,390	65,339	92,145	118,447
Totals	8,381,163	6,772,392	2,776,547	3,900,163	3,124,509	4,008,933	2,857,170	3,883,802

TABLE 23. King crab catch, deliveries, and average weight, by district - Cook Inlet - 1970.

	SOUTHERN DISTRICT				KAMISHAK DISTRICT			
	Crab	Pounds	No. Del.	Ave. Wt.	Crab	Pounds	No. Del.	Ave. Wt.
Jan	4,198	36,697	19	8.7	10,995	96,694	13	8.8
Feb	28,535	233,361	114	8.2	23,868	212,041	16	8.9
Mar								
Apr								
May								
June								
July								
Aug	145,004	1,016,561	365	7.0	74,943	570,074	17	7.6
Sept	21,027	153,825	142	7.3	67,696	547,669	23	8.1
Oct	1,836	12,876	21	7.0	56,149	457,164	18	8.1
Nov	1,997	14,566	16	7.3	35,189	285,389	14	8.1
Dec	3,874	27,873	22	7.2	7,967	68,228	5	8.6

	OUTER DISTRICT				MONTHLY TOTAL			
	Crab	Pounds	No. Del.	Ave. Wt.	Crab	Pounds	No. Del.	Ave. Wt.
Jan	3,800	34,914	2	9.2	18,993	168,305	34	8.9
Feb	140	1,180	1	8.4	52,543	446,582	131	8.5
Mar								
Apr								
May								
June								
July								
Aug					219,947	1,586,635	382	7.2
Sept	7,027	54,486	4	7.7	95,750	755,980	169	7.9
Oct	952	8,604	4	9.0	58,937	478,644	43	8.1
Nov	3,333	28,254	3	8.5	40,519	328,209	33	8.1
Dec	2,650	22,346	3	8.4	14,491	118,447	30	8.2

collected from these surveys appears in Table 24. The observer, or shellfish technician, was also responsible for assisting in sampling the commercial catch. A total of 7,635 king crab were measured at the canneries in 1970. Of these, 2,639 were crab harvested in the Southern district and 4,996 were from the Kamishak district. Table 25 shows the percent of crab by size group, by month, and the sample size.

Unloading and Weighing Operation

In October, a new program was inititated to check the accuracy of fish ticket receipts. The king crab unloading and weighing operation at the cannery docks was monitored by a department observer. The main objective of this project was to ascertain whether the number and pounds of crab were being reported accurately. The data collected during 1970 indicated a high degree of accuracy on fish ticket receipts from both Cook Inlet crab processors. It appears that average weights obtained from fish ticket data by adding number of crab into pounds is accurate and usable data.

Catch Per Unit of Effort

The catch per unit of effort for king crab in Cook Inlet is currently being measured in three different ways. (1) The average number of crab per landing (Table 21). (2) The average number of crab per pot as reported on fish tickets (Table 26), and (3) The log book program. The log book program was initiated in August, 1970, and to date has not been too successful. Fishermen seem reluctant to participate in the program for some reason. More effort will be put into stressing the importance of the log book data to fishermen in 1971. The C.P.U.E. data

TABLE 24 Cook Inlet king crab catch composition surveys, 1970.

Southern District

Date	Number Pots Sampled	Legal Males	Percent	Sub-legal Males	Percent	Females	Percent	Tot Cra
2-25	62	433	15.8	123	4.4	2194	79.8	275
8-20	25	331	15.5	602	28.2	1200	56.3	213
10-29	15	16	10.3	64	41.3	75	48.4	15
12-10	8	10	1.3	424	57.0	310	41.7	74

Kamishak District

Date	Number Pots Sampled	Legal Males	Percent	Sub-legal Males	Percent	Females	Percent	Tot Cra
8-14	50	1463	22.6	2852	44.2	2143	33.2	645
10-21	60	3209	75.4	1040	24.4	4	.1	425
11-23	92	4536	68.5	1307	19.7	382	5.8	662

TABLE 25 Length frequencies Cook Inlet king crab, 1970. 1/

Southern District

Month	Percent 140 mm 2/	Percent 150 mm	Percent 160 mm	Percent 170 mm	Percent 180 mm	Percent 190 mm	Percent 200+mm	Samp siz
February	6.2	26.5	31.9	24.8	8.3	2.4		339
August	18.3	46.3	24.7	9.0	1.5			1005
October	17.8	34.6	27.4	16.1	2.7	1.4		292
November	15.9	33.0	29.8	17.6	2.8			500
December	28.2	31.6	24.4	13.3	1.8	.6		503

Kamishak District

Month	Percent 140 mm	Percent 150 mm	Percent 160 mm	Percent 170 mm	Percent 180 mm	Percent 190 mm	Percent 200+mm	Samp size
February	2.5	17.2	26.5	27.1	19.0	6.6	1.0	483
August	17.6	41.5	21.1	12.3	6.9	.5	.1	1116
October	11.3	30.4	29.9	20.7	6.6	1.1		884
November	12.1	26.5	31.3	22.1	7.0	.9	.2	1241
December	4.8	19.6	32.7	26.9	12.3	3.4	.4	1272

1/ Expressed in percent by size group.

2/ 140 mm group includes all crab from 140 mm to 149 mm.

obtained from fish ticket receipts indicates a stable situation in both the Southern and Kamishak districts.

Management Techniques

In addition to a quota, there are two other protective measures in Cook Inlet to insure the propagation of crab stocks. One is a closed season in the entire Inlet from March 1 to July 31. This covers most of the period when crab are moulting, breeding, and in softshell condition. The other safeguard is the establishment of a breeding sanctuary area located in Kachemak Bay. This area is closed from January 16 to February 28.

Management techniques in Cook Inlet include close monitoring of landings for carapace lengths and average weights (See Tables 27, 28, 29 and Figure 13) plus catch composition surveys on the fishing grounds. These surveys are made to the major fishing areas during months when heavy effort takes place. Some of the data collected includes number of pots pulled, depth fished, number of legal male, sublegal male, female, number of softshell, and number of Tanner crab. These surveys are intensified during the months of February and August as these are the months when the highest catches are made and also the months that present the greatest management problems. In addition to the above, we have initiated a log book program similar to the one now in use in the Kodiak area.

Management Needs

One of the prime management needs in Cook Inlet at the present time is a vessel capable of work on the crab grounds. At the present time, the

Table 26 King crab average catch per pot, by month and district, 1968-1970.

Year	Month	District Kachemak	Kamishak	Outer
1968-69	August	11.5	26.0	---
	September	6.7	19.7	---
	October	4.5	20.3	3.2
	November	2.6	24.7	---
	December	6.4	20.9	---
	January	2.4	20.0	27.9
	February	3.8	11.1	10.3
Seasonal Ave.		4.2	20.7	16.3
1969-70	August	15.3	41.9	29.2
	September	14.3	30.8	---
	October	8.8	15.0	---
	November	---	---	---
	December	7.1	16.3	---
	January	5.3	16.6	17.4
	February	5.8	22.7	---
Seasonal Ave.		11.3	27.6	19.6
1970-71	August	17.8	25.0	---
	September	5.6	35.3	45.4
	October	2.1	29.7	9.0
	November	10.8	29.5	21.0
	December	3.7	19.9	2.9
	January	7.3	15.5	1.8
	February	6.1	4.2	8.9
Seasonal Ave.		11.6	27.9	23.0

TABLE 27 Comparative measurements of king crab carapace lengths, winter and summer crab.

February and March

Carapace Size Range	KAMISHAK 1963	1964	1970	1971	KACHEMAK 1962	1963	1966	1970	1971
140 to 159 MM	14%	14%	20%	20%	4%	21%	16%	33%	20%
160 to 179 MM	62%	51%	54%	61%	59%	52%	65%	56%	68%
180 to 200 MM+	23%	34%	27%	19%	37%	27%	19%	11%	12%

August

Carapace Size Range	KAMISHAK 1963	1968	1969	1970	KACHEMAK 1963	1968	1969	1970
140 to 159 MM	46%	52%	44%	59%	69%	58%	65%	65%
160 to 179 MM	43%	39%	44%	33%	28%	38%	32%	34%
180 to 200 MM+	11%	10%	12%	8%	3%	4%	4%	1%

TABLE 28 Average weight 1/ of king crab, by month, by year, Cook Inlet, 1966-1970.

	January	February	March	April	May	June	July	August	September	October	November	December
1966 Kachemak	9.1	9.3	9.0	8.8	8.7	8.7	8.0	7.9	7.7	7.5	7.9	8.1
1966 Kamishak				9.1	9.2	9.0	7.9	8.2	8.3	8.5	8.7	9.2
Ave. Cook Inlet 2/	9.1	9.3	9.1	8.9	9.2	8.9	8.0	8.0	8.1	8.1	8.7	8.5
1967 Kachemak	8.8	9.4	9.1	8.8			6.9	7.6	7.5	7.4	8.0	7.5
1967 Kamishak			9.9	9.7			7.9	8.1	8.3	8.0	9.4	
Ave. Cook Inlet	8.8	9.4	9.2	9.6			7.5	7.9	8.2	7.9	8.9	7.5
1968 Kachemak	8.2	8.8	8.5	8.2				7.7	7.4	7.2	8.2	8.3
1968 Kamishak	9.3	9.8	10.1	9.9				7.6	8.7	9.2	8.9	9.3
Ave. Cook Inlet	8.9	9.3	9.8	9.9				7.6	8.4	9.1	8.7	8.7
1969 Kachemak	8.6	7.7						7.3	7.0	7.0		7.8
1969 Kamishak	8.9	11.0						7.8	7.7	8.4	8.0	9.1
Ave. Cook Inlet	8.7	8.8						7.5	7.4	7.9	8.0	8.5
1970 Kachemak	8.7	8.2						7.0	7.3	7.0	7.3	7.2
1970 Kamishak	8.8	8.9						7.6	8.1	8.1	8.1	8.6
Ave. Cook Inlet	8.9	8.5						7.2	7.9	8.1	8.1	8.2

1/ Weight in pounds, rounded to nearest tenth. Weights computed from Alaska Department of Fish and Game fish ticket receipts.

2/ Average weight for entire Cook Inlet area including Outer District.

TABLE 29 Cook Inlet king crab average weights, 1960-1970.

Year	Kamishak District average weight	Southern District average weight
1960	No fishery	9.2
1961	8.6	8.5
1962	9.1	8.2
1963	8.7	8.1
1964	8.4	7.9
1965	8.9	8.2
1966	8.7	8.5
1967	8.5	7.9
1968	8.9	8.3
1969	7.9	7.2
1970	8.1	7.2
Total average	8.6	8.1

Figure 12. Average weight king crab, Kamishak and Southern districts, Cook Inlet, 1961-1970.

largest vessel used in Cook Inlet by the Department of Fish and Game is a 19' cabin crusier. A vessel in the 50' class or above is needed to conduct management surveys, research, and protection.

Shrimp Catch

The total Cook Inlet shrimp catch in 1970 was 5.7 million pounds which is more than triple the harvest of any previous year (Figure 14). There are only three other years on record where the catch exceeded one million pounds - 1961, 1963, and last year, 1969. The high catch in 1963 represents the peak of the fishery prior to the earthquake when processing facilities were located in Seldovia and Seward. When the 1964 quake wiped out these plants, it took five years before any intensive effort in this fishery resumed. In July of 1969, Alaskan Seafoods of Homer finished installation of two shrimp peelers and two small boats began fishing in Kachemak Bay. The peak month of harvest in 1969 was October when 432,848 pounds were taken. The total catch for 1969 was 1,847,202 pounds.

By late spring 1970, the effort increased to three boats and two additional shrimp peelers were put into operation with a potential processing capacity of about one million pounds per month. The peak month of production in 1970 was July when 852,126 pounds were landed and the total catch in 1970 was 5,724,688 pounds (Table 30).

The shrimp catches by year since 1960 appear in Table 31.

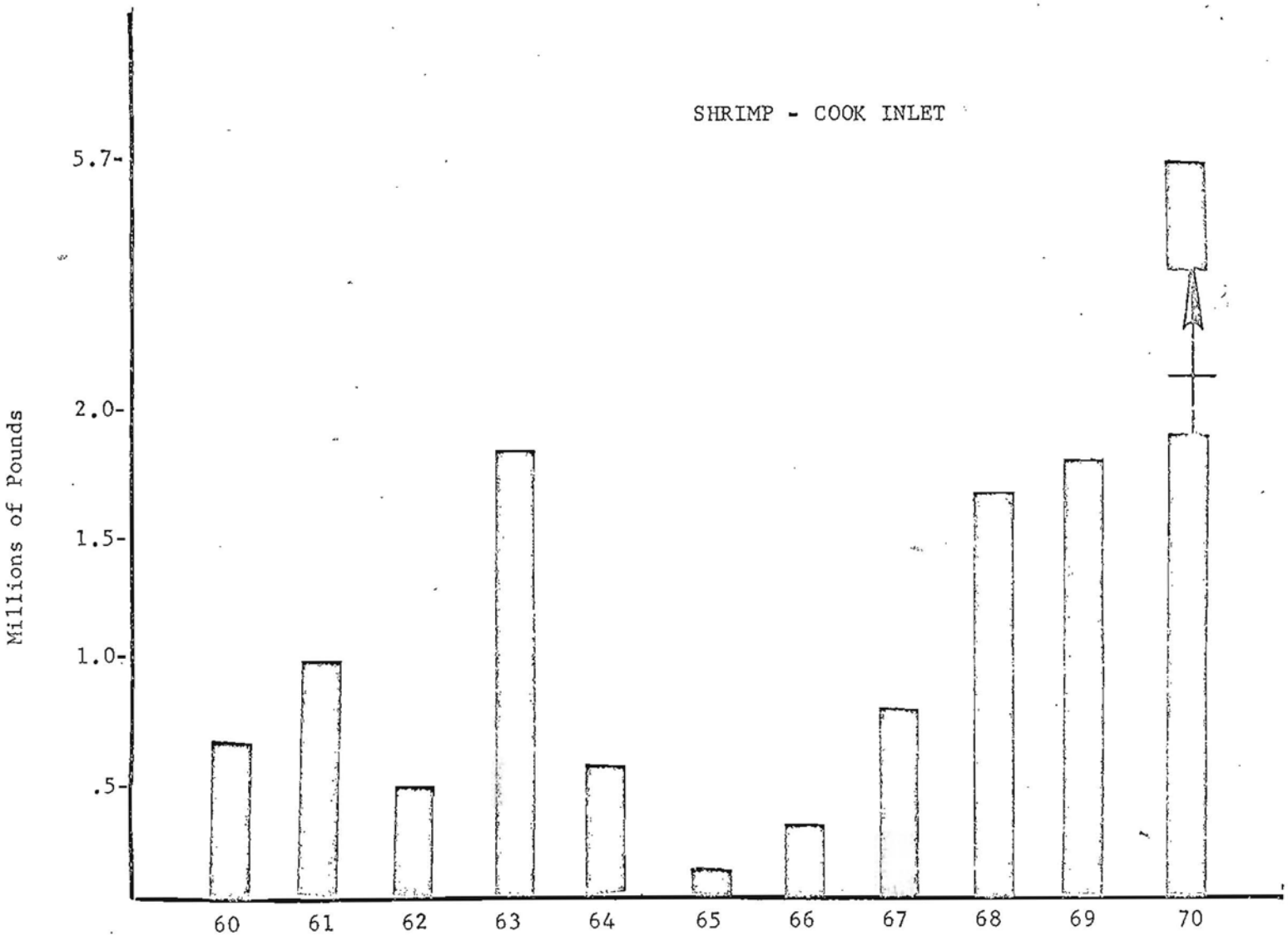


Figure 14. Cook Inlet shrimp catch, 1960-1970.

TABLE 30 Shrimp trawl catches and landings by month, 1970. 1/

Month	Pounds	Cumulative Pounds	Landings
January	215,036	215,036	21
February	448,856	663,892	41
March	494,894	1,158,786	38
April	550,731	1,709,517	49
May	338,599	2,048,116	33
June	665,715	2,713,831	66
July	852,126	3,565,957	67
August	767,600	4,333,557	47
September	603,127	4,936,684	49
October	324,360	5,261,044	41
November	386,357	5,647,401	44
December	77,287	5,724,688	27
Totals	5,724,688	5,724,688	523

1/ All shrimp caught in Kachemak Bay.

TABLE 31 Shrimp landings in pounds, Cook Inlet, 1960-1970.

Year	Trawl	Pots	Total
1960			711,355
1961			1,045,170
1962			532,291
1963	1,897,580		1,897,580
1964	599,665	1,746	601,411
1965	82,280		82,280
1966	285,976	23,383	309,359
1967	741,438		741,438
1968	26,099	561	26,660
1969	1,847,202		1,847,202
1970	5,762,920	9,473	5,772,393

Tanner Crab

1968 was the first year of any commercial production of tanner crab in Cook Inlet. Due to a shortened season in king crab, a tanner fishery developed to keep the fishermen and canneries in operation. A total of 54 thousand tanner crab were caught in 1968, weighing 165 thousand pounds. The average weight per crab for the entire season was 3.1 pounds. The peak month of production was May when a little over 80 thousand pounds were harvested. All but 4,000 pounds of the 1968 catch was taken in Kachemak Bay.

In 1969, an increase in fishing effort resulted in a catch of 484 thousand crab weighing about 1.5 million pounds. The average weight was the same for 1968 -- 3.1 pounds per crab. The peak month in 1969 was April when 459 thousand pounds were landed. Again, Kachemak Bay was the main area of production.

This past year, 1970, there was less effort for tanner crab than in 1969. A total of 314 landings were made last year as compared to 538 landings in 1969. The catch in 1970 was 1.3 million pounds with the peak month of production in April and May (Table 32 and 33). The average weight for the 1970 season was 2.9 pounds as compared to 3.1 pounds for 1968 and 1969. About 1.1 million pounds were taken in Kachemak Bay and the remainder in the Eastern and Kamishak districts.

Fishing is allowed for tanners in Cook Inlet twelve months of the year and the only regulation in effect at the present time is the 4' maximum tunnel width which was designed to keep legal size king crab from entering the tanner pots.

TABLE 32 Tanner crab landings, by area, Cook Inlet, 1970.

Month	Southern	Kamishak	Outer	Eastern	Total
January	51,789	9,523	82		61,394
February	151,402	3,968			155,370
March	262,990				262,990
April	362,306			51,685	413,991
May	255,997	54,614		52,424	363,035
June	21,824				21,824
July					
August					
September					
October					
November	365	240			605
December	12,788		1,267	1,742	15,797
Totals	1,119,461	68,345	1,349	105,851	1,295,006

TABLE 33 Tanner crab landings, by month, in pounds, Cook Inlet, 1968-1970.

Month	1968	1969	1970
January		35,860	61,394
February	6,284	144,556	155,370
March	8,613	295,993	262,990
April	45,200	459,231	413,991
May	80,420	177,206	363,035
June	5,420	288,752	21,824
July		55,935	
August	340		
September	490		
October	1,570	10,308	
November	1,514		605
December	15,296	11,783	
Year Totals	165,147	1,479,624	1,295,006
No. Landings	152	538	314
No. Vessels	25	24	25
Average Wt.	3.1	3.1	2.9

In addition to monitoring the commercial catch, carapace length frequencies (Figure 15) have been taken and catch composition surveys on the fishing grounds have been made.

Dungeness Crab

The total 1970 dungeness crab harvest in Cook Inlet was 208,577 pounds. The bulk of the catch was made in the months of August, September and October (Table 34). Peak effort also took place during these three months when 75 percent of the landings were made.

The Cook Inlet dungeness crab catch from 1961 to 1970 appears in Table 18.

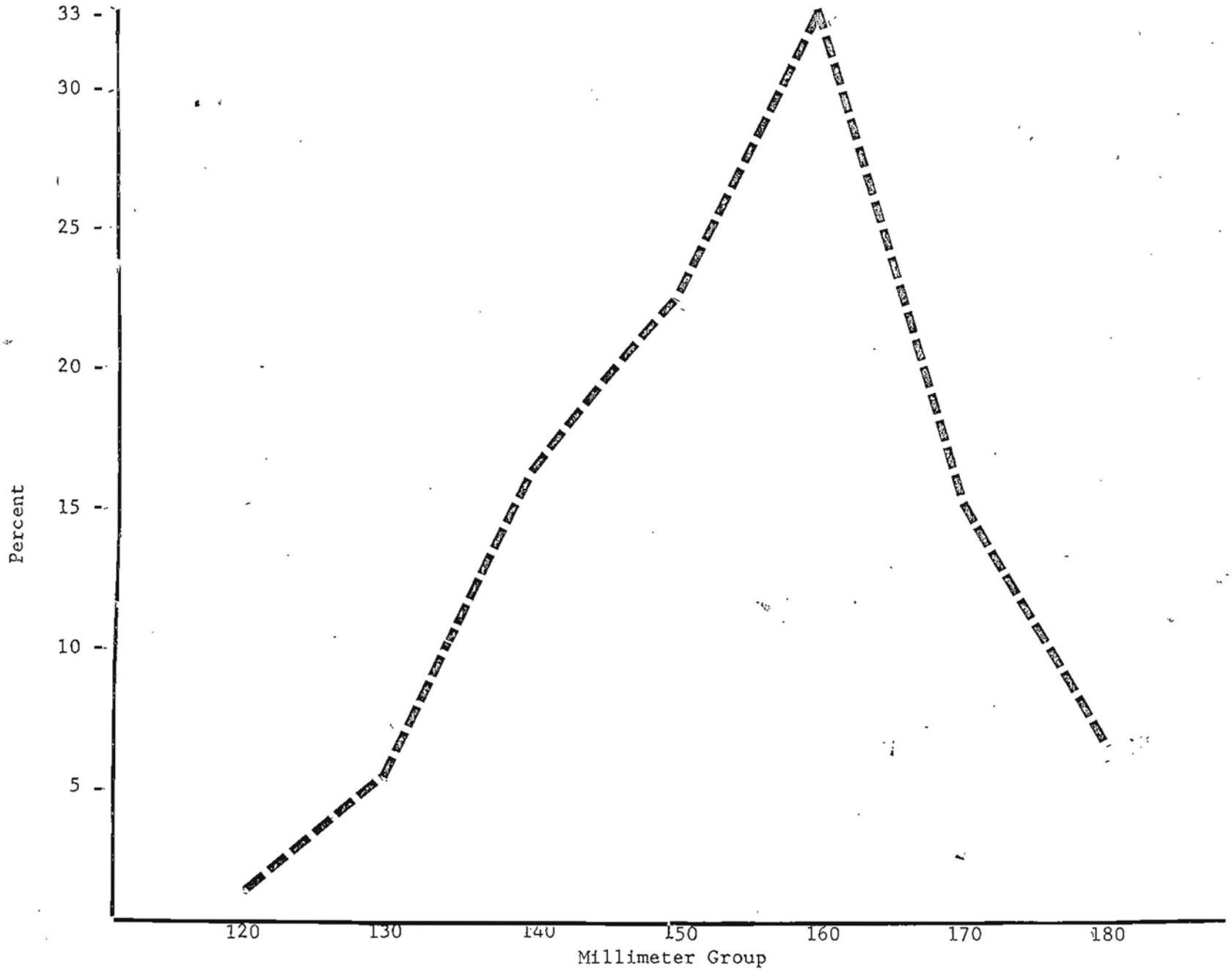


Figure 15. Tanner crab width frequencies by percent, Cook Inlet, 1970.

TABLE 34 Dungeness crab catch and landings, by month, Cook Inlet, 1970.

Month	Kachemak Bay Pounds	Landings	Boats
March	115	2	1
April			
May			
June	7,889	5	1
July	15,009	4	1
August	36,371	7	4
September	95,555	16	6
October	52,265	14	5
November	1,373	1	1
Totals	208,577	49	

TABLE 35 Cook Inlet dungeness crab catch, 1961-1970.

Year	Crab	Pounds
1961		191,588
1962	204,573	460,725
1963		1,677,204
1964	177,708	421,452
1965	32,378	82,280
1966	45,625	130,499
1967	2,141	7,168
1968		378,941
1969		48,501
1970	84,686	208,577

MISCELLANEOUS FISHERIES

Herring

Historic catch statistics and information concerning the Cook Inlet herring fishery is fragmentary and leaves much to the imagination.

Areas of greatest concentration of herring in Cook Inlet include the Eastern, Southern, Outer and Kamishak districts. Spawning usually occurs in the latter part of April through May, but will vary from area to area.

Commercial herring fishing commenced in Cook Inlet in 1914 as a gill-net fishery in Halibut Cove located in Kachemak Bay. All herring were supplied to a local saltery. The minimum size allowed for salting was 10 1/2 inches. Industry expanded rapidly and by 1925 there were eight salteries operating in Kachemak Bay. Gillnetting remained the chief method of catching herring until 1923 when purse seining was introduced. Purse seines proved to be more efficient and more wasteful since a seine would pick up the small herring that would pass through a gill net. These small herring were useless to a salting operation and were discarded.

Available catch data is presented in Table 36 for the period 1914 through 1928.

For the period 1929 through 1969 it is known that herring were taken for bait purposes, however, catch statistics have not been found for this period, it is thought that annual catches were insignificant.

In 1969 six processors took herring in Cook Inlet, a total of 2,694,961 pounds were landed, catch in pounds by district is shown in Table 37. Most of the herring taken in 1969 was salted and sold to foreign markets. Same sac roe was taken on an experimental basis; however, it was less than 100 000 pounds.

In 1970, herring operations expanded in the Seward, Anchorage and Port Graham areas with a threefold increase in catch, 9,617,935 pounds; of this 5,417,385 pounds were taken in the Southern district and 4,200 550 in the Eastern district. As in 1969, the fish were used almost exclusively for roe extraction. Most of the Eastern district catch comes from the Seward Small Boat Harbor with very little production outside the harbor.

Catch statistics for 1969 and 1970 are in Table 37.

TABLE 36 Cook Inlet herring catches in pounds

YEAR	TOTAL	YEAR	TOTAL
1914	311,346	1922	1,007,690
1915	29,400	1923	7,562,356
1916	138,474	1924	14,080,002
1917	1,886,745	1925	19,228,331
1918	3,970,029	1926	14,272,399
1919	5,296,386	1917	7,181,349
1920	1,918,497	1928	4,304,157
1921	5,222,176		

TABLE 37 Cook Inlet herring catches, by District, in pounds, 1969 - 1970

YEAR	DISTRICT	POUNDS	LANDINGS	VESSELS
1969	Southern	1,103,041	41	5
	Outer	76,000	1	1
	Eastern	1,515,920	32	7
Total		2,694,961	74	12
1970	Southern	5,417,385	104	11
	Eastern	4,200,550	81	11
Total		9,617,935	185	22

Appendix Table 20

1969	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]
1971	Southern	25,050	4	2
	Eastern	1,948,023	129	19
Total		1,973,073	130	21
1972	Southern	2,046	1	1
	Eastern	131,634	11	86
Total		~~133,680~~ + 26,100 = 169,780	12	~~87~~

* [illegible]

Appendix Table 1. Cook Inlet total salmon catch, by species, 1965-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1954[1/]	65,325	1,246,672	336,685	2,460,051	775,659	4,884,392
1955	46,499	1,064,128	180,452	1,286,008	317,053	2,894,140
1956	65,310	1,295,095	207,534	1,803,295	870,269	4,241,503
1957	42,767	670,629	127,199	306,841	1,207,920	2,355,356
1958	22,847	496,842	241,561	2,598,314	596,179	3,955,743
1959	32,783	634,313	112,664	137,255	411,157	1,328,172
1960[2/]	27,539	948,040	314,153	2,023,252	776,079	4,089,063
1961	19,778	1,185,079	119,397	337,394	405,221	2,066,869
1962	20,270	1,172,859	358,051	4,960,030	1,149,841	7,661,051
1963	17,632	958,101	203,876	234,052	525,537	1,939,198
1964	4,622	990,709	462,114	4,287,378	1,402,419	7,147,242
1965	9,751	1,426,352	154,363	139,561	344,052	2,074,079
1966	8,586	1,867,372	295,042	2,585,616	661,883	5,418,499
1967	8,035	1,409,107	180,455	407,717	382,282	2,387,596
1968	4,600	1,200,138	473,645	2,862,939	1,183,037	5,724,359
1969[3/]	12,461	813,435	105,616	232,203	310,142	1,473,857
1970	8,054	750,111	276,770	1,352,389	999,005	3,386,329
17 Year Average	24,521	1,066,411	244,093	1,647,900	724,572	3,707,497
Per cent	0.66	28.76	6.58	44.46	19.54	100.0

1/ 1954-1959 data - Fish and Wildlife Service Statistical Digest 50.

2/ 1960-1968 data - Alaska Department of Fish and Game IBM Salmon Report.

3/ 1969-1970 data - Alaska Department of Fish and Game Fish Tickets. (Preliminar

Appendix Table 2. Comparative salmon pack, by species, in 48 pound cases, Cook Inlet-Resurrection Bay area, 1960-1970.

Year	Kings	Sockeye	Cohos	Pinks	Chums	Total
1960[1/]	9,279	65,478	24,091	87,575	62,709	249,132
1961	12,942	88,687	10,673	30,401	39,092	181,795
1962	8,721	89,231	28,611	208,392	107,724	442,670
1963	8,138	74,185	20,898	13,509	46,209	162,939
1964	921	75,944	40,137	188,373	135,466	440,841
1965	1,221	109,663	11,999	5,911	27,187	155,981
1966	1,472	142,987	22,985	102,796	49,680	319,920
1967[2/]	1,907	119,522	15,774	21,492	39,274	197,969
1968	557	76,368	34,873	117,812	126,554	356,164
1969[3/]	1,551	49,569	7,290	85,897[4/]	30,754	175,061
1970	498	49,993	18,654	56,786	68,140	194,071
Eleven Year Average	4,291	85,602	21,453	83,540	66,617	261,503
Per cent	1.6	32.7	8.2	32.0	25.5	100.0

1/ 1960-1966 statistics taken from Statistics Leaflet No. 13, Department of Fish and Game.

2/ 1967-1968 statistics taken from Cook Inlet annual management reports.

3/ 1969-1970 statistics taken from Alaska Department of Fish and Game final Mimeo #1 report.

4/ The majority of these were caught in Kodiak and canned in Cook Inlet.

Appendix Table 3. Gear registration by type, residency, and year, Cook Inlet-Resurrection Bay, 1960-1970.

Year	R.-NR.[1]	Drift	Set	P.Seine	B.Seine	Troll	Sub-Total	Percent	Total
1960	R	221	511	86	12	2/	830	88.8	935
	NR	67	59	9	-	-	105	11.2	
		288	540	95	12	0	935		
1961	R	279	564	85	6	8	942	88.8	1,061
	NR	93	22	4	-	-	119	11.2	
		377	586	89	6	8	1,061		
1962	R	260	589	84	5	9	947	86.6	1,094
	NR	112	28	7	-	-	147	13.4	
		372	6.7	91	5	9	1,094		
1963	R	333	626	102	5	12	1,078	85.4	1,262
	NR	139	34	10	-	1	184	14.6	
		472	660	112	5	13	1,262		
1964	R	323	596	102	5	3	1,029	84.6	1,217
	NR	145	35	6	2	-	188	15.4	
		468	631	108	7	3	1,217		
1965	R	329	556	66	9	6	966	83.8	1,153
	NR	145	34	6	-	2	187	16.2	
		474	590	72	9	8	1,153		
1966	R	328	580	72	4	8	992	71.0	1,255
	NR	176	48	5	-	4	233	29.0	
		504	628	77	4	12	1,225		

Appendix Table 3 continued

Year	R.-NR.[1]	Drift set	P.Seine	B.Seine	Troll	Sub-Total	Percent	Total
1967	R	350 554	53	3	11	971	80.0	1,214
	NR	186 50	5	-	2	243	20.0	
		536 604	58	3	13	1,214		
1968	R	407 638	85	4	10	1,144	81.8	1,398
	NR	204 43	6	-	1	254	18.2	
		611 681	91	4	11	1,398		
1969	R	479 686	72	19	21	1,277	83.4	1,532
	NR	208 42	3	-	2	255	16.6	
		687 728	75	19	23	1,532		
1970	R	537 707	86	18	23	1,371	82.5	1,661
	NR	220 65	3	0	2	290	17.5	
		757 772	89	18	25	1,661		
Eleven Year Average		504 640	87	8	11			1,250
Per cent		40.3 51.2	6.9	0.7	0.9			100.0

1/ R designates resident gear registered.
NR designates non-resident gear registered.

2/ Number of units of troll gear registered for 1960 is not available.

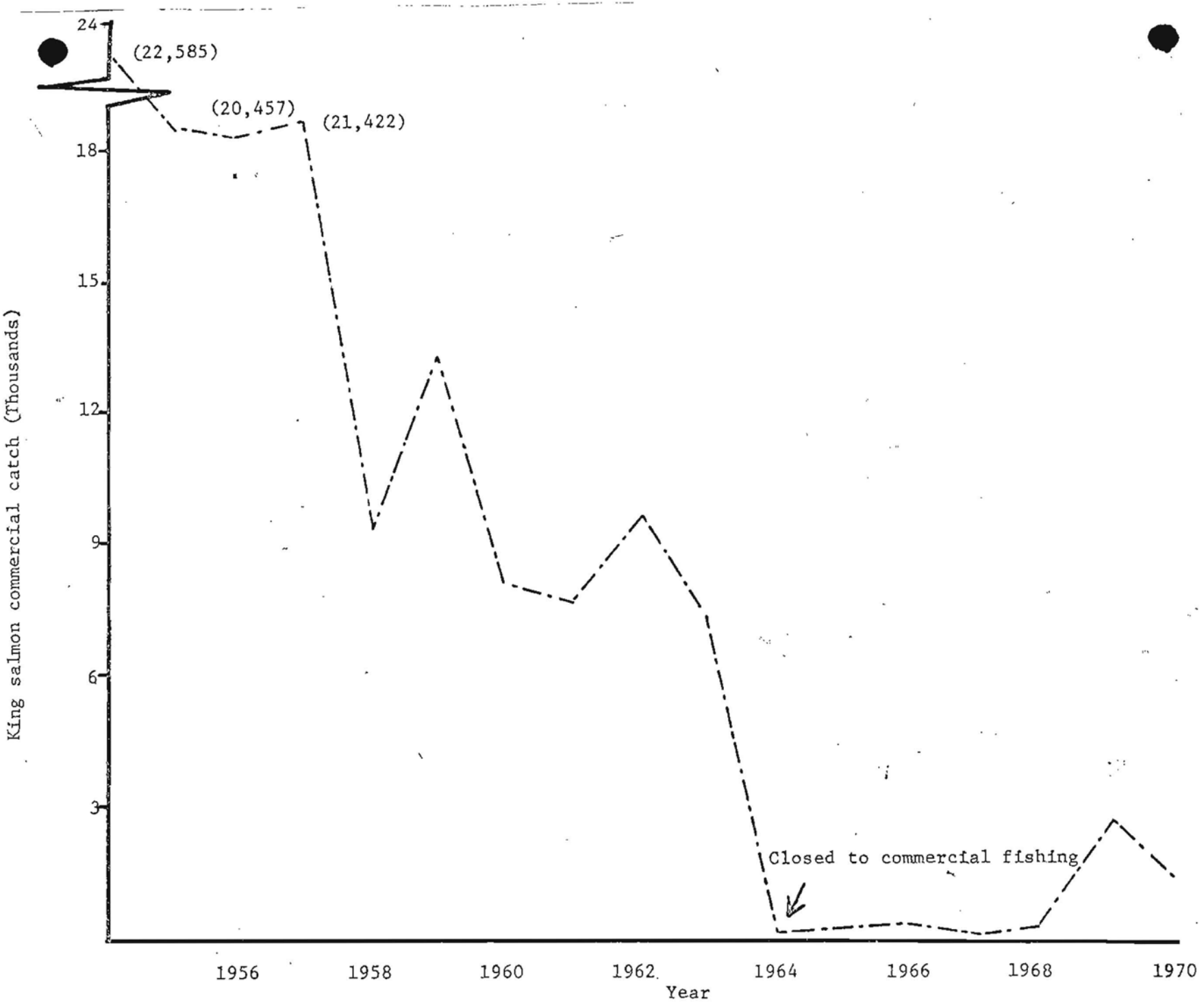
Appendix Table 4. Cook Inlet fresh-frozen salmon, by species, in pounds, 1960-1970

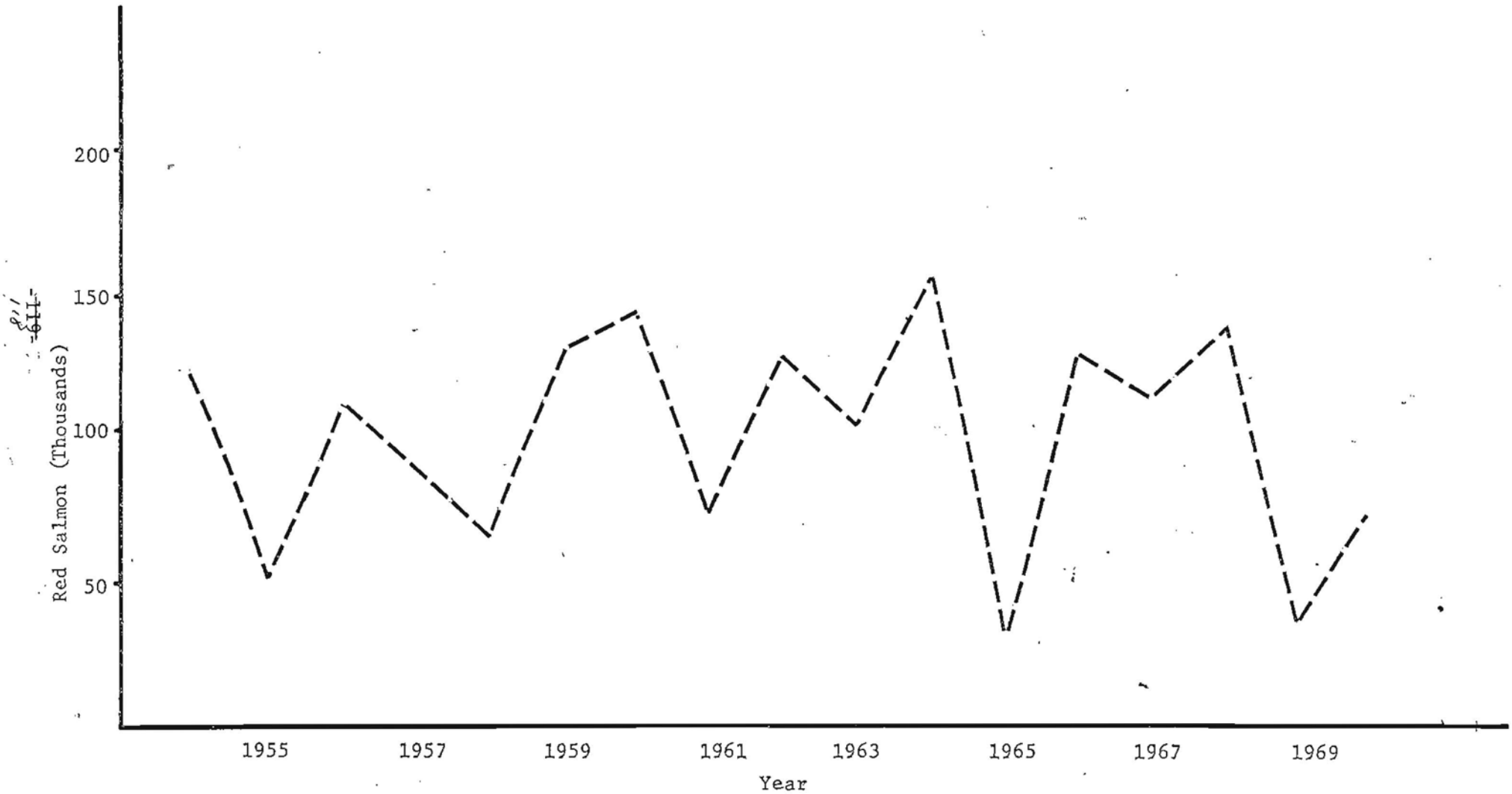
YEAR	KINGS	REDS	COHOS	PINKS	CHUMS	TOTAL
1960*	51,569	86,726	90,472	64,860	10,876	304,503
1961*	40,305	14,308	122,966	199,670	28,241	405,490
1962*	41,326	7,821	367,984	53,922	67,211	538,264
1963*	68,240	15,115	65,547	1,384	3,895	154,181
1964	10,488	0	0	0	0	10,488
1965	86,561	585,986	81,234	15,000	119,912	888,693
1966	46,307	496,815	89,794	1,083,986	437,995	2,154,897*
1967	137,747	350,318	223,748	11,974	181,569	905,356
1968	71,923	484,745	732,096	350,768	647,350	2,286,882
1969	415,328	1,016,043.5	209,922	67,075	593,748	2,302,116.
1970	180,275	449,256	307,690	497,462	1,437,844	2,872,527*

* Converted to pounds

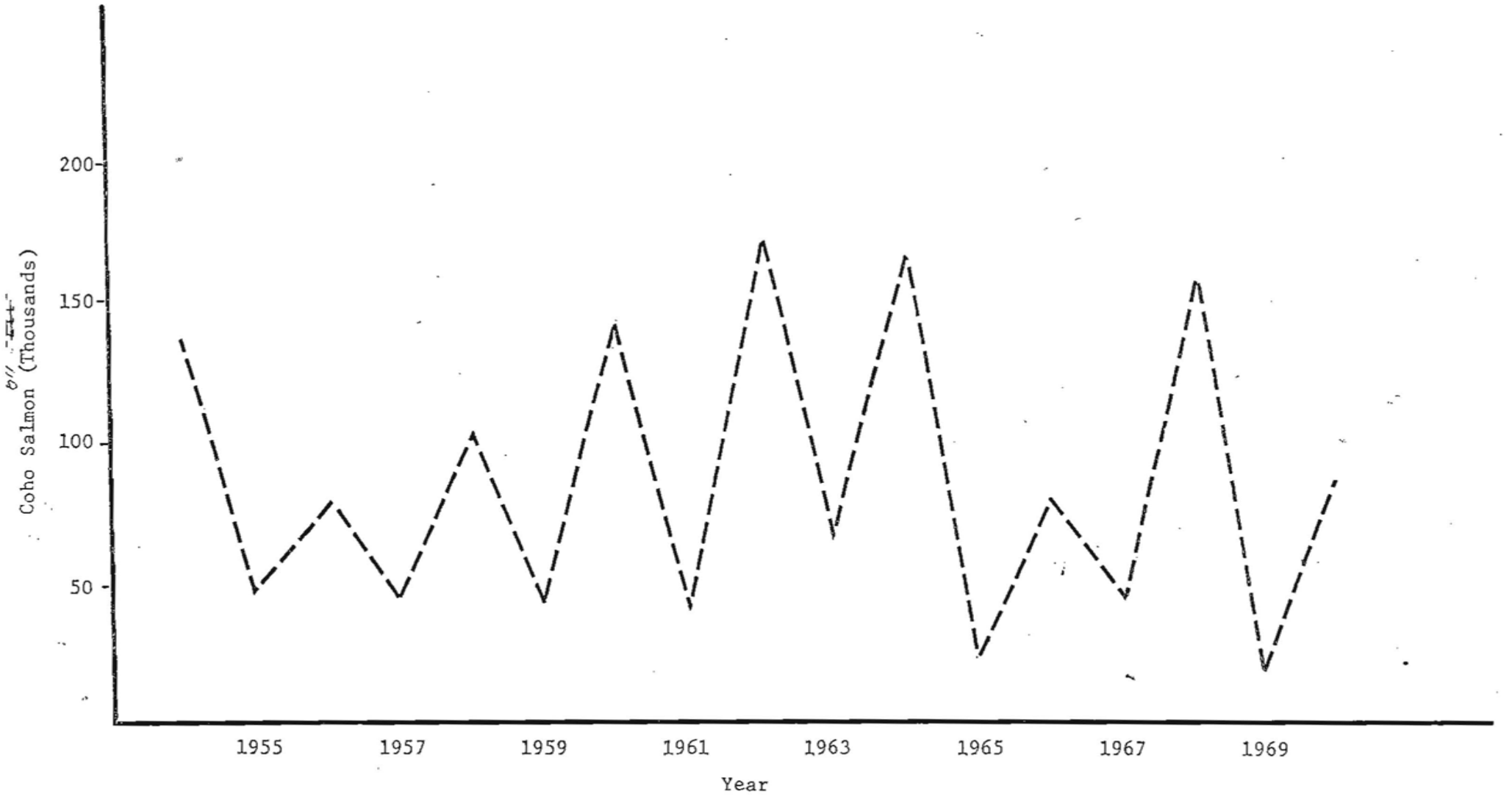
** Includes estimated pounds delivered to Japanese ships. (1,107,399#)

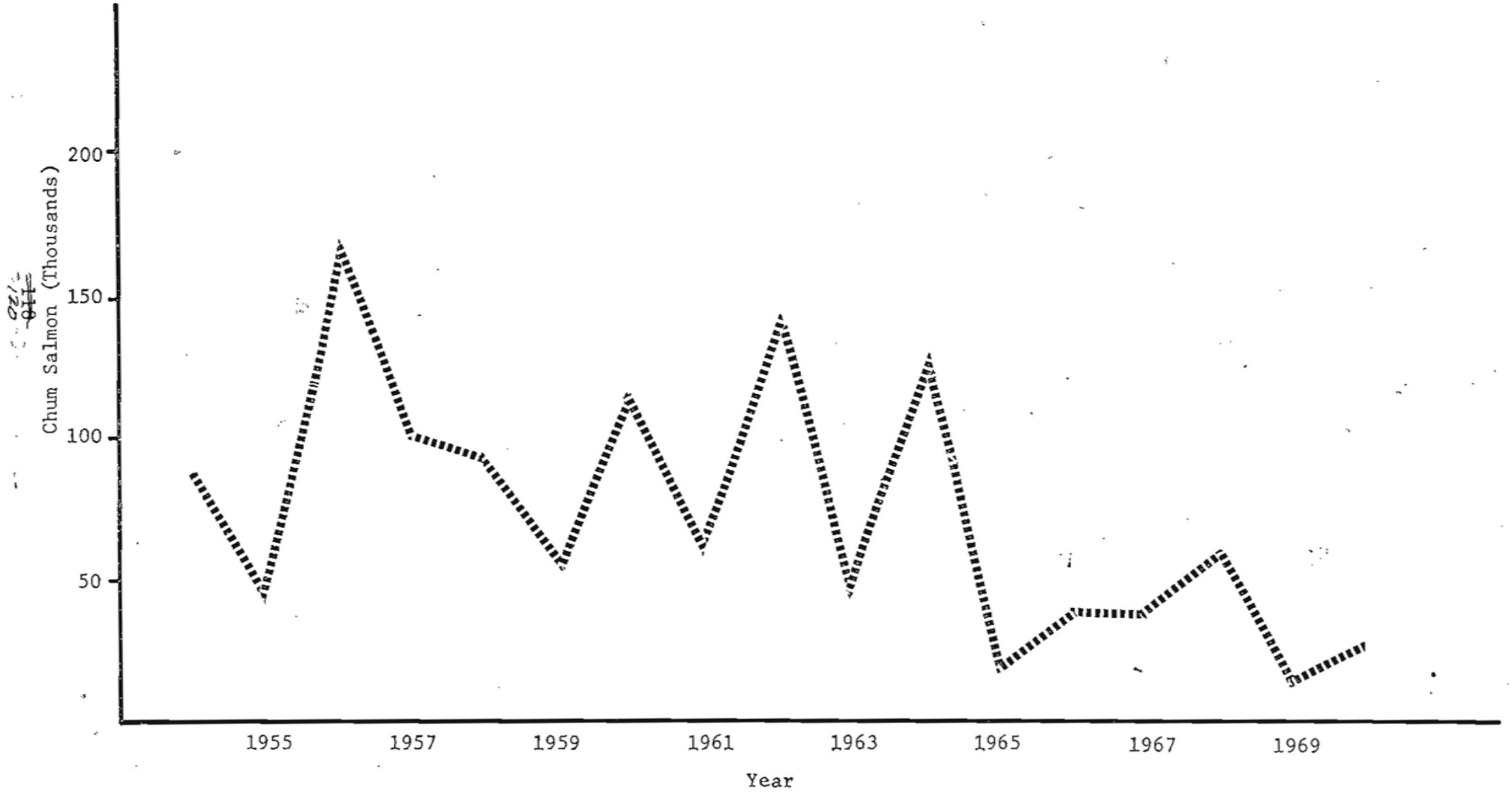
*** Includes addtional pounds from other areas---
Kodiak and Price William Sound: Kings 40; Reds 23,349; Cohos 143,493; Pinks 62,679; & Chums 64,259; TOTAL 293


24
18
15
12
9
6
3
(22,585)
(20,457)
(21,422)
King salmon commercial catch (Thousands)
Closed to commercial fishing
1956
1958
1960
1962
1964
1966
1968
1970
Year



Appendix Figure 2. Red salmon commercial catch. Northern District. Cook Inlet 1954-1970.


200
150
100
50
Coho Salmon (Thousands)
1955
1957
1959
1961
1963
1965
1967
1969
Year


Chum Salmon (Thousands)
200
150
100
50
1955
1957
1959
1961
1963
1965
1967
1969
Year